2021

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A Tutorial on Technology Transfer

IN U.S. COLLEGES AND UNIVERSITIES

Update Released October 1, 2021

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Foreword

This Tutorial, originally published in 2000, has been compiled through the efforts of the Council on Governmental Relations (COGR) and is being updated in 2021 to help the reader understand modern technology transfer practices of U.S. colleges and universities. To thoroughly address the topic, this work is arranged in a series of steps. The Tutorial begins with a broad discussion of the role technology transfer plays in adding value to the academic and research mission of universities and colleges. It describes the federal legislation that provides the launching platform for university technology transfer in the U.S. The tutorial then moves to a discussion of those elements of intellectual property that make up the legal fabric of "transferable" technology or property and is provided with a closer look at the nuts and bolts of the process of technology transfer in a "how to" section. The Tutorial concludes with a consideration of indirect consequences of technology transfer, such as conflicts of interest unintentional skewing of the charitable mission, and student involvement in outside activities, and how these issues are managed within the university.

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Contributors

COGR would like to thank the Research Security & Intellectual Property Management Committee (RSIP) for contributing to the update of this paper, originally published in 2000 and last updated in 2011 by the then-titled Contracts and Intellectual Property Committee (CIP). Special thanks to RSIP Committee Members John Ritter, Director, Office of Technology Licensing at Princeton University, and Dan Nordquist, Deputy Vice President for Research Operations at Washington State University and colleagues for their contributions to this update.

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Introduction: The Role of Research Institutions in the New Economy

A basic purpose of universities is to transfer technology, most commonly through the education of students. Knowledge transfer from universities and other research institutions[1] has been seen as an important component of regional and state economic development for many years going back to the U.S. Civil War and the establishment of land grant universities. In more recent years formal transfer of rights in intellectual property created by universities and other research institutions has received increasing emphasis and attention by policymakers at all levels. This Tutorial focuses on these formal modes of technology transfer. Most attention is focused on patenting and licensing of technologies for further development, but other important formal means by which technologies may be transferred also are discussed.

The university mission of teaching and research -- of creating and disseminating knowledge -- is its primary contribution to society as a whole and to the increasingly knowledge-based economy. But universities also have an obligation to be good stewards of the intellectual property that is created utilizing federal funding and ensure that it inures to the benefit of society. The enactment of the 1980 Bayh-Dole Act provided the basic framework for this stewardship by establishing a uniform policy that allowed university recipients of federal funding to own the inventions and thus providing an incentive for universities to expend the resources necessary to protect the intellectual property and facilitate the legal agreements necessary to see this intellectual property developed by commercial entities into products and services in the marketplace.

The most recent survey by the Association of University Technology Managers shows universities executed 10,050 licenses and options with commercial entities and had 8,706 patents issued in fiscal year 2020. Moreover, 1,117 startup companies were created around university intellectual property during this period. A report commissioned by the Biotechnology Industry Organization (BIO), documents the significant impact academic1 technology transfer makes on the U.S. economy. The report entitled, "The Economic Contribution of University/Nonprofit Inventions in the United States: 1996-2017[1]," documents the sizeable return that US taxpayers receive on their investment in federally-funded research. It shows that, during a 22-year period, academic patents and the subsequent licensing to industry bolstered US industry gross output by up to $1.7 trillion, US GDP by up to $865billion, and supported up to 5.9 million person years of employment.

This tutorial, updated in 2021, is meant to provide a general overview of the myriad of issues that universities face as stewards of this important component of the U.S. economy.

[1] *Pressman, Lori and Planting, Mark A. and Bond, Jennifer and Yuskavage, Robert and Moylan, Carol E., The Economic Contribution of University/Nonprofit Inventions in the United States: 1996 – 2017 (June 2, 2019). Available at SSRN: https://ssrn.com/abstract=3777218*

I. *Technology Transfer: A Definition*

The activity that we call "technology transfer" is not a new phenomenon. For many years it has been commonplace within the business sector of the economy to engage in *transfers* of information, manufactured devices, prototypes, and materials. These transfers are often accomplished by means of a legal instrument, through the provision of services, or through direct sales. Within the last forty years, universities have adopted the "technology transfer" label for their own activities. The phrase *technology transfer* in its broadest sense encompasses many activities at U.S. universities. Perhaps the best known and most widely used informal "transfer" mechanisms are scholarly publication and the education of students and other trainees.

For purposes of this Tutorial, the term is used more narrowly to refer to the licensing of intellectual property rights from the research institution to the for-profit sector for purposes of commercialization. This "passing over" or *transfer* is made possible through patenting of institution-made inventions and/or assertion of copyright for institution-developed software, multimedia teaching tools and educational materials. Institution-owned biological materials developed in institution laboratories, registration of institution trademarks, and trade secrets add to the general pool of transferable intellectual property. Unlike industry, where transfer sometimes takes place as an actual sale of the information, article or service to be transferred, non-profit research institutions in almost all cases accomplish transfers of intellectual property, while retaining ownership, through the *licensing process*. Biomaterials which are not captured as patents may be licensed or conditionally transferred as *bailed property* with limited approved uses under contracts known as "material transfer agreements"[2].

II. *Technology Transfer: An Important Contribution to the University Mission*

Research institutions primarily engage in technology transfer to enhance the likelihood that new discoveries, innovations, uses of physical materials, and applications of science provide a tangible benefit to society. This benefit may be in the form of solving industrial and medical problems, or developing new and useful products, processes and services. By establishing new research partnerships, exchanging materials and information, and collaborating with industry personnel, new dimensions are added to research programs that also provide unique research and growth opportunities for faculty, students, and trainees. Since technology transfer can result in an income stream from license revenue, the inventors of a successfully commercialized technology also get to share in that financial return to recognize their intellectual contributions and encourage their participation in the technology transfer process. Further, that income also benefits the research institution as it is reinvested in new research and teaching programs and provides financial support for students.

Engineering, biotechnology, computer science, law, and business students eager to participate in developing new technologies, in learning the fundamentals of new company formation, and in working with faculty and industry to realize the potential of new business models often find that technology transfer activities give them a running start at careers that will build the economy in the 21st century. Thus, technology transfer directly benefits the institution's mission to advance research and education to actual practice.

III. *The Bayh-Dole Act: Providing the Platform for University Technology Transfer*

The Bayh-Dole Act (the "Act") provides recipients of federal funding with the right to elect ownership of inventions made under federal funding in exchange for the recipient actively seeking to advance (or promote) the commercialization process. Since a significant portion of nonprofit research is funded by the federal government, it is important that institutional policy regarding technology transfer be consistent with both the objectives and the federal law and policy as set forth in the Act. Some objectives of the Act require promoting commercialization and public availability of inventions, encouraging maximum participation of small business and ensuring that the government obtains sufficient rights in federally supported inventions.

Recipient institutions also assume responsibility for complying with the requirements of the Act, which includes disclosing inventions received by the institution to the sponsoring agency, and electing title to such inventions within a defined timeframe. When title is elected, the institution is required to file a patent application, submit a confirmatory license to the funding agency and submit periodic reports regarding the invention's utilization. These and other obligations are not trivial. Universities and non-profit institutions must make serious commitments to comply with the federal regulations that implement the Act. As indicated, the government retains certain rights in all federally funded inventions made by universities and other non-profits, chief among these is a nonexclusive, nontransferable, irrevocable, paid-up license to the invention to practice it or have it practiced for or on its behalf.

For a more comprehensive description of the Bayh-Dole Act and its requirements, the reader is invited to refer to the COGR Guide on Bayh-Dole.

IV. *Intellectual Property: An Indispensable Component of Technology Transfer*

Research institution policies are quite clear that technology transfer must be conducted in ways which do not conflict with the mission of teaching, research and dissemination of knowledge. Such policies recognize that protection of intellectual property is essential in order to attract the additional investment needed to develop ideas into useful products and therefore work to balance between openly sharing knowledge and protecting new intellectual property. This balance is what makes technology transfer through licensing possible.

U.S. research institutions, including universities, have developed extensive policies to address various kinds of intellectual property: ownership as between the institution and the individual inventors, authors and creators; how decisions on commercializing the intellectual property will be determined; and how any revenues earned as a result of licensing activity will be shared. However, there is some variation among institutions with respect to the types of work product that the institution seeks to protect and how it is protected.

As noted above, the handling of patentable inventions following the disclosure of an invention will consider the investment necessary to enhance the likelihood that new discoveries, innovations and applications of science

provide a tangible benefit to society. Additionally, research institutions also engage in transfer determinations with respect to the licensing of copyrightable materials, including *works of authorship* including s*oftware*, *multimedia work*s, scholarly works, and, in some cases, *instructional materials.* Works of authorship comprise a body of information protected by *copyright*. Copyright protects the original expression of an idea in a creative work. A very different structure of intellectual property protection from patents, *copyrights* may be every bit as challenging as patents in coaxing out those elements that are candidates for commercial licensing. A marketable copyrighted work is apt to be the endgame in a long process such as developing and programming computer software and documentation, weaving together the text, video, music, film and other components of a multimedia work, or the bringing together the curriculum, pedagogy and instructional tools of an educational program or course. Identifying the market-readiness of copyrighted works is very different from pinpointing the more specific activity that was the conception or reduction to practice of a patentable invention. Researching the provenance of an authored work, simply to establish whether the institution has sufficient rights in the work to make it a viable candidate for commercialization, takes an in-depth knowledge of copyright law and the patience to trace scholarly and creative contributions back to their source.

Trademarks and *trade secrets* are additional categories of intellectual property that the research institution may consider protecting in order to increase value for a product or service to be commercialized. A trade secret can be a formula, pattern, compilation, program, device, method, technique, or process that provides a competitive edge to a business entity. Importantly, a trade secret must remain unpublished in order to have value as intellectual property. Because research institutions generally publish all research findings, there is limited trade secret licensing. Moreover, because this is a highly specialized area of intellectual property, practitioners are advised to seek intellectual property counsel when considering a trade secret license.

Finally, certain materials (such as biological materials for example) that may be transferred under material transfer agreements, and datasets that are transferred under data use agreements constitute forms of intellectual property that must also receive additional consideration in a technology transfer portfolio.

Many of the factors leading to successful licensing of patents are also relevant to the licensing of non-patented materials. While the legal fundamentals of these different kinds of intellectual property are not alike, the steps in considering whether an intellectual property "product" is marketable, assessing its value, and finding a licensee are not altogether dissimilar. However, the license terms will vary since the legal "metes and bounds" of patents, copyrights and trademarks are different. A successful technology transfer organization will develop sufficient sophistication to handle this variation. Nevertheless, an even greater challenge is presented by new technologies that are not defined solely as "a patent" or "a copyright" or "a trademark" but combine multiple kinds of intellectual property protection, such as a computer program that is comprised of a *patented* algorithm, a *copyrighted* computer code and a name or identifying logo that is *trademarked*.

A. Formulating an Intellectual Property Policy. Research institutions define their intellectual property activities through their policies. Each institution tailors its policy to meet institutional principles and objectives. This means that defining principles and objectives or goals is fundamental and must be the first step in the process. Because establishing intellectual property protection generally informs a series of events that will follow, an institution formulating a policy must decide when that outcome will serve the goals of the

institution and when it will not. The following is a listing of factors that are generally considered in developing a sound policy for dealing with intellectual property and may prove useful to the reader.

- Identifying the fundamental institutional principles, objectives and goals;
- Considering (not neglecting) the legal basis for ownership;
- Federal patent and copyright laws defining ownership;
- The employee-employer relationship creating the "work-for-hire" situation;
- State laws affecting intellectual property ownership in public institutions;
- The requirements of federal procurement regulations attaching to federal grants and contracts;
- Federal and state tax consequences of intellectual property ownership and disposition;
- *Academic custom* with respect to scholarly publication;
- Types of intellectual property that will be protected and will be candidates for *transfer;*
- Royalty sharing with inventors and authors;
- Rights of the university to retain use rights in licensed or individually owned intellectual property; and
- Institutional responsibility for administration of the policy.

B. Managing the Intellectual Property Assets. The complexity of technology transfer activities requires that research institutions give considerable thought to intellectual property management. Over the 40+ years since Bayh-Dole moved patent ownership from the federal government to the institutions, technology transfer offices have worked diligently to develop the expertise necessary for managing the complicated intellectual property portfolios of research institutions. Successful management of an institution's intellectual property assets demands personnel with sophisticated knowledge of intellectual property, licensing, and contract law, along with an in-depth understanding of current business realities and the ability to predict new market trends while developing and maintaining strong relationships with industry. And, perhaps of greatest importance, the technology transfer office must understand the overall institutional policy context within which it works. It must recognize and successfully resolve conflicts, or perceived conflicts, between its own activities and the broader university mission.

Researchers and technology managers must understand the policies and procedures that are designed to manage a complex set of agreements and the intellectual property rights associated with these agreements. As a consequence of the specialized knowledge and expertise developed in the technology transfer office in managing intellectual property, the technology transfer professional is an indispensable member of institutional teams that frame policies and procedures for constructing a wide variety of university research relationships with industry and the concomitant issues that may arise, such as conflicts of interests of graduate students and faculty who hold equity interests in start-up companies, or potential conflicts of interest that may occur on account of personal interests of individuals involved in institution research funded by companies. The important role of the technology transfer manager in helping to establish procedures where studies involve clinical trials, environmental studies or public safety to ensure that the apportionment of intellectual property rights do not undercut the credibility of the research results or the position of the university as an impartial source of scientific knowledge and information cannot be overstated.

V. *Technology Transfer: How the Process Works*

The technology transfer process begins when a research investigator or creator identifies a discovery or innovation that may be protectable or completes a copyrightable work which they believe may have potential for commercial development.

A. Submitting the Disclosure.

The first formal step in the process occurs when an inventor or creator submits a "disclosure" form describing the innovation to the institutional office that has responsibility for licensing activities (for convenience called the Technology Licensing Office or "TLO"). The disclosure briefly describes the idea of the new discovery or invention, what it does, and what advantages it has over the state of the art. Other types of information included on a disclosure form typically are:

- Names of the inventors or authors;
- The federal agency, industrial company or other organization sponsoring the research that spawned the discovery;
- In the case of an invention, if and when the invention has been published or whether publication is imminent;
- Potential commercial markets for the innovation;
- Companies that may be interested in licensing the discovery; and
- In the case of software, whether documentation has been written.

B. When the Disclosure is an Invention

1. Evaluating a Disclosure for Patenting.

If the disclosure is an invention, the TLO will further evaluate the disclosure to establish the marketability and patentability of the invention to determine whether it seems advisable to pursue patent protection. Securing a U.S. patent costs on the order of $20,000-40,000 each and filing for equivalent foreign protection can increase the ultimate cost several-fold. The decision whether to file a patent application generally is based on the answers to at least three questions:

(a) Based on the state of publicly known information about the elements of the discovery (called "prior art"), is the invention likely to be patentable, and is the patent likely to be broad enough in scope to have commercial value (that is, to cover a substantial product or class of products, rather than just a minor variation on known and existing products). The first question is answered by a search of the literature and the past patents, often with the help of a professional search librarian, and sometimes by consulting a patent attorney and asking for a *patentability opinion* based on the patent attorney's search of all resources.

(b) If it were patented, would the invention be likely to attract the commercial investment needed for development through a license, or is there a corporate sponsor who has the first option to negotiate a license? This second question is far more difficult to answer. It depends on the potential market for the product; the likely technological success of developing the invention into a practical product; the type of

technology and whether investors are currently interested in investing in such fields; what are the competitive technologies; potential regulatory hurdles; manufacturing expenses; and even the current state of the economy. The more innovative the technology, the more difficult it is to conduct market research in an efficient, meaningful manner, since the potential investors and customers may never have envisioned such a product.

(c) Are there funds available within the institution or from a prospective licensee to pay for the patenting costs? The answer to this question is one of practicality. Since a TLO may receive a significant number of invention disclosures each year, it will not have the financial resources to investigate the commercial potential in detail for each invention or to invest in the costs of patenting for each invention. Consequently, all TLOs must make choices.

Other factors contribute to making the decision on patenting one of the most difficult a TLO must make. Impending or actual scientific publication of the invention limits the time for decision making, since patents must be filed before publication if foreign patent coverage is not to be lost; and must be filed within one year after publication if only U.S. patent protection is sought. Since most institutions, as a matter of policy, may only request the investigator to temporarily delay publication for patenting purposes, very often patenting decisions must be made quickly. The TLO is forced, then, to make "educated guesses" based on its knowledge of the technology and the market, coupled with some cursory discussions with the inventor(s) and perhaps with a few potential licensees.

Some institutions may use patent committees comprised of faculty or outside advisors to help with the patenting assessment. There are pros and cons to be considered when deciding to use outside committees or outside advisors. Two to consider are (i) the length of time that it may take to convene outsiders to evaluate patenting an invention and (ii) the accountability factor – the fact of outsiders making decisions on spending the limited financial resources of the TLO. There may be benefit, though, in having an invention evaluated by impartial experts on an ad hoc basis who may understand the marketplace or who are able to judge how high the invention registers on the “innovation” scale.

2. Filing the Patent Application. If the decision is made to file an application, the TLO can engage a patent attorney to work with the inventor(s) to write the patent application, file it in the U.S. Patent and Trademark Office, and follow it through the patenting process. In order to comply with the procedural requirements imposed under U.S. Patent Law, licensing or staff professionals in the TLO must have a good understanding of the patenting process and the various strategies under current patent law for filing provisional and utility patents.

If the invention was funded by a U.S. federal agency, a series of reporting requirements begins at the time of Invention Disclosure and escalates once the decision is made to file. As noted above in the section on Bayh-Dole, failure to follow reporting requirements may result in the loss of patent rights. Under most institution technology transfer policies, if the institution decides it will not file for patent protection, there

is an opportunity for the inventors to decide whether they would like ownership transferred to them (disclosure of the invention must still be made to the funding agency). The process for requesting a waiver, or endorsing an inventor's request for waiver to the funding agency in the case of a federally-funded invention, should be well established within the institution.

3. Marketing the Patent (finding a licensee)

(a) The challenge of licensing inventions. As a general statement, an institution will file a patent application on an invention only if it intends to license the invention for commercial development. The challenging basic premise with respect to inventions is that most often they are early stage and therefore of unproven market potential. Often additional research must be undertaken before the real work of product development can even begin. Few companies are willing to take the risk such early-stage inventions require, particularly where, as in the case of many medically-related inventions, it may take many years of research and development before it is known whether the product will be successful. A company or investor generally must have a long product-planning horizon before it will consider investing in university patents. For this reason, traditional methods of technology marketing, such as advertising the invention, publishing lists of technologies available for licensing, or using Internet listing services, meet with limited success in finding licensees for university patents. By way of comparison, other methods such as partnering with other units on campus to increase marketing exposure or going to specific trade shows has been shown to result in better marketing outcomes. Conducting additional marketing campaigns has also been shown to be the gold standard that provides an effective return on market engagement and giving better conversion rates.

(b) When licensing begins. Potentially, a license to the patent - particularly if it is exclusive or partially exclusive - increases the incentive for the company to make the risky investment in development, since the patent can protect the company ("the licensee") from competition in the marketplace if the product is successfully developed. Research institutions typically seek licensees as soon as the patent application is filed, rather than wait the 2-5 years until the patent is issued due to the aforementioned cost and investment that the institution would need to provide upfront. The motivation for early licensing is to get industry investing in the technology as soon as possible and to maximize the full patent term for the product. Additional motivation comes from the institution's need to get its patent filing and prosecution costs reimbursed so that these funds can be directed back into the office to support patent filings on other inventions. Most licenses are connected to the life of the patent, as such if the patent fails to issue, the license is terminated since there is no protected intellectual property (unless the license covers other types of intellectual property, such as trademarks or copyrighted software, which are not dependent upon valid patent protection).

(c) Identifying potential licensees. Most research institutions with successful licensing programs find that it is important to know a variety of companies in fields where the university conducts significant research and to focus on the technology plans and the unmet needs of those companies. At the same time, efforts are made to encourage companies and potential investors to get to know the institution and its researchers. Then, when a new invention arises, the potential for a "customized" introduction is already in place. It is seldom that an institution is able to find more than one potential licensee at a time for an invention. Those institutions

interested in developing the technology as quickly as possible (rather than holding it for years trying to find the optimal licensee), will usually begin negotiations for a license with the first qualified company or investor who wishes to negotiate for a license. Before any serious effort at negotiations have progressed too far, though, the potential licensee must demonstrate that it has the technical, financial and marketing capabilities to develop the invention into a product or service and to bring it to market. In the case of a license to a start-up entity, due diligence provisions should be added to the license to ensure that the start-up can or will raise enough capital in order to develop the technology.

(d) Selecting the licensee. In those rare cases where more than one qualified licensee has requested a license, the institution will consider co-licensees, or may divide the license by *field of use* (see below). If neither of these alternatives is commercially practical, the university will make a judgment as to which is the better prospect for licensing, taking into consideration the financial and technical capabilities of the candidates to develop and market the technology and the commitments each is willing to make to reach the marketplace. While royalties and license fees offered may tip the scales, all things being equal, greater weight will be given to the candidate most likely to succeed in the unpredictable business of turning university inventions into commercial products. It should be noted that although there is some risk that a small or start-up company may fail more often than a larger licensee, a small company licensee may be the best choice because of its motivation to carry a "signature" product through to commercialization.

4. Negotiating the License

(a) Field of the License. Some inventions cover multiple products in a number of different fields. A biological invention, for example, may have applications in research, in diagnostics, in vaccines, and in therapeutics. A chemical synthesis method may have applications in agriculture, polymer synthesis, and in pharmaceuticals. If the licensee is a large multi-divisional company with businesses in all fields of the invention and is willing to commit to product development in all fields, the license granted may be broad; if the company's business is limited to a single field, then a *field of use* may be specified in the license, and the company's rights to exploit the invention limited to that field. This will leave the invention licensable to companies working in other fields.

(b) Exclusive or Nonexclusive within a field (or in all fields). A license may be *nonexclusive* (that is, similar licenses may be granted to a number of companies) or *exclusive* (one company only) but in both instances the research institution maintains ownership of the intellectual property. In the case of federally funded inventions, under Bayh-Dole, all licenses must acknowledge that the federal government also has a license for government purposes. Exclusive licenses are generally desirable when the licensee must make a large, high-risk investment to bring the product to market. Few companies will be willing to undertake such an investment if licensing rights are available to other companies once the original company's development is successful.

Nonexclusive licenses are generally desirable when the invention is a broadly applicable process or has self-evident technological advantages which will be useful to many companies and so it is not necessary to

"induce" investment. Nonexclusive licenses are highly preferable where the invention is a research tool, useful to both the commercial and academic communities and a high degree of access is important. In some cases, where the development cycle is relatively short, an exclusive license may be granted for a limited period of time -- long enough for the original licensee to recoup its development investment from the marketplace -- after which the license becomes nonexclusive and licenses may be granted to other companies.

(c) Diligence requirements. If a license is granted to a company, the research institution must assure that the company will work diligently to develop the invention. Neither federal nor institution policies allow a patent to be licensed in order to "put it on the shelf" – a circumstance that might be attractive to some licensees if the invention threatens to compete with an existing product. In the event that an invention is federally funded, the government can require the university to grant a license to a third party under certain circumstances, or the government may take title and grant licenses itself using "march-in rights". This might occur if the invention is not brought to practical use within a reasonable time, if health or safety issues arise, if public use of the invention is in jeopardy, or if other legal requirements were not satisfied[3]

Consequently, an important part of any license negotiation is the *diligence provisions*. These requirements may include, for example, specifying the number of people assigned to develop the invention within the company, the amount of funding a company will commit to development, or in the case of a small company the amount of investment capital that will be raised to fund development. Where the development of the product is sufficiently predictable at the time of licensing, the diligence provisions may specify a date by which a working prototype of the product is made, a date by which the first commercial product must be sold, and sales levels that must be achieved by certain dates. Diligence provisions are a mandatory contractual commitment. If diligence provisions are not met, the university may cancel the license or, if the license was exclusive, rather than terminating the license altogether, the university may make it nonexclusive, thereby regaining the option to grant licenses to others.

(d) Royalties and other financial considerations. The financial considerations for a license involve a balancing of risks and rewards. Since many institution inventions tend to be at an early stage of development at the time of licensing, royalty rates and license fees are typically lower than those between commercial companies licensing one another. At the same time, research institutions are usually unwilling to "cap" royalties at a pre-determined dollar value in the license. Since the institution is sharing the "downside" with lower license fees and royalty percentages, it is reasonable to share in the "upside" if the product is very successful and value received by the licensee is greater than anticipated. The financial components of the deal are negotiated between the research institution and the licensee and typically include:

(i) *Reimbursement of the institution's patent costs:* This is required, almost without exception, for exclusive licenses. The same requirement frequently extends to any even non-exclusive licenses where the institution seeks patent protection, with each licensee contributing a proportional share of the costs.

(ii) *License issue fee*: This fee may range from a very few thousand dollars to a quarter of a million or more. It is usually a fact-specific determination depending upon the stage of development of the invention (well developed as a result of significant investment by the university, or less well-developed requiring considerable investment by the licensee), the size and breadth of the patent package, whether

any patents have issued or whether all are still pending, the size of the potential market, the specific requirement needed to commercialize the technology, and so forth. These are factors contributing to the "value" of the invention. For small companies and start-ups, the license issue fee may be partially postponed until sufficient investment capital is secured by the company.

(iii) *Annual license maintenance fees*: Many institutions use these as a way of sharing the risk with the licensee. An annual license maintenance fee allows the institution to charge a lower license issue fee upfront, and assures that the company shows an active interest in retaining the license as evidenced by its willingness to make a financial commitment to renew the license annually. Some institutions allow annual maintenance fees to be treated as "minimum royalties" so that if the company is paying significant running royalties, no additional annual maintenance fee is required.

(iv) *Running royalties*: These are usually specified as a percent of sales of the product or service covered by the patent. The rate depends on many factors, including the profitability (margin) of the class of product covered by the invention; the size of the market; the stage of development of the technology when licensed; whether the product also falls under patents owned by others; and whether the institution's technology is the key enabling technology for the product or just a minor component. Typically, institution patents command royalties in the range of 1 to 6 percent of product sales; occasional licenses include royalties outside that range based on specific factors.

(v) *Equity shares*: When a license is granted to a young privately held company, shares of stock in the company may be offered to the research institution as a form of royalty under the license. Often, other license fees and/or running royalty percentages may be lowered in consideration of the equity shares. Not all institutions have policies allowing them to accept equity in lieu of royalties and some state institutions may face legal or other policy restrictions that limit their ability to accept equity.

(e) Additional License Terms. Licenses also commonly include activity reporting requirements for the licensee; agreement (in the case of an exclusive license) as to which party will prosecute patent infringers and how damages will be shared; agreement on which party will have responsibility for prosecuting and maintaining patents and in which countries; circumstances under which, and procedures for, terminating the license; and the administrative and legal processes for handling disputes between the parties.

Finally, and very important for the research institution, provisions are placed in licenses for protecting the institution as licensor. To protect the institution's ongoing research and educational programs, under any exclusive license grant, the institution usually retains the right to use the licensed technology for those purposes as well as the ability to sublicense those rights to other not-for-profits. Most research institutions will insist on a *Non-Use of Names* provision prohibiting the use of the institution's name to promote the

company or the products made under the license. Research institutions will also require *Indemnification and Insurance* provisions. Since in virtually all research institution licensing situations the licensee has complete control over product development, it must also assume all responsibility for any product liability arising from the company's use of the invention. Many institutions require evidence that a company has obtained sufficient insurance to honor its obligations to protect the university.

5. Distribution of Patent Licensing Revenues. As required under Bayh-Dole, all U.S. research institutions have instituted policies governing the disposition of revenues earned from technology transfer activities. Most commonly, the first revenues received from a license are used to repay the institution for the patenting costs of the invention if the license does not hold the licensee accountable for these costs. Thereafter, revenues are generally distributed according to a formula that has been adopted by the institution. Although each research institution has its own specific formula, in most cases, inventors will receive approximately one-third of revenues earned from the licensing of their patents ("inventors' share"), although the percentage is higher in some institutions and lower in others. Some institutions implement a sliding scale, with the inventor's share higher in the early years of a license when the royalty return tends to be lower. The remaining revenues are distributed within the institution ("institutional share") in proportions that vary widely between the inventor(s)' laboratories, the inventor(s)' departments, and in the case of universities, the university's general fund.

Under the Bayh-Dole Act, the institutional share from federally funded inventions, regardless of where within the institution it is distributed, must be used wholly for research and educational purposes (although allocating some revenues to support costs incidental to the administration of subject inventions is permitted).

Very occasionally, an institution will experience more significant income, as a result of a company going public, or in the case of a product which has found large acceptance in the marketplace. While these situations are relatively rare, they give universities an opportunity to put funds to good use as in endowing academic chairs, underwriting new technology developments and providing an endowment for student scholarships.

C. When the Disclosure is Computer Software

1. Choosing the Best Form of Protection. Unlike subject matter that qualifies only for a single form of intellectual property protection, computer software is generally copyrightable and may also have elements that are patentable. Most often, the patentable element of a computer program will be an algorithm or method that is used for a novel purpose. The challenge for a TLO is to determine whether to pursue patent protection in addition to copyright protection. While copyright protection, will prevent the unlicensed copying, distribution, modification, adaptation, display of the computer code and is inherent is such an original creative work with no additional filings or cost, patenting will require a commitment of time, effort and money, as previously discussed. The advantage of patenting, however, is that it protects the idea itself, and is therefore a stronger form of protection than copyright. Since patent protection covers different elements than copyright protection, it is altogether possible, and may

be commercially advantageous, to seek both kinds of protections. It must be pointed out that where a software product is both patented and copyrighted, the license will be drafted to include rights and obligations that are normally included in a patent license and the rights and obligations that are normally included in a software license (as further described below). These licenses are complex and require detailed knowledge of both patent and copyright licensing.

2. Choosing the Best Form of Licensing. Making decisions as to whether software is best commercialized under an exclusive license or by licensing multiple end users is often determined by the nature of the software and its intended use. If the software is complex, requires continuous maintenance and updating, then, unless an institution has an interest in acting as a software distributor, the best choice may be licensing it exclusively to a licensee that has the capability, financial resources and interest to staff itself with programmers to maintain the software for end users and to continue developing and enhancing it. While some institutions have made these capabilities a part of their normal activities, most have not and prefer to look for a licensee interested in undertaking this type of business.

   Often software programs developed at a university are in the nature of educational, mathematical, design or other types of software tools. If the software program is not complex, it may be licensed directly by the university, on a non-exclusive basis, to end-users. Setting up a software end-use licensing capability is not difficult. Most often a standard, *pro forma* license will be drafted and used for all transactions. In the case of direct distribution, a decision will have to be made whether it is the TLO that will undertake end-use licensing or whether the department, laboratory or center that developed the software will do it.

   Very briefly, to "open source" software is to make source code available for collaborative development by anyone while the owner still maintains copyright. Depending on the type of agreement, "open source" is essentially a license that allows users to use the software free of charge and may require users to divulge source code and to not enforce any copyright for any derivative work.

   Institutions have varying polices regarding open source licensing but many allow the researchers who create the code to open source it directly. There are many kinds of open source licenses, all of which have at least minimal strings attached to the license. Kinds of licenses range from BSD (mostly a permission to use and requirement to give proper attribution, copyright remains with the Institution) to GPL (all subsequent users must keep derivative software open sourced). Many institutions do not make any particular recommendations as to which open source license is preferable. A good source of information regarding open source software licensing is OpenSource.org.

3. Finding a Licensee. Many commercial software developers market their own proprietary products and may have less interest in marketing institution-developed software unless it is truly unique and the market for it is either a large one, or the software, itself, is of such complexity that it will (i) command a high price in the marketplace as one-of-a-kind, or (ii) require maintenance and updating which, itself, may be profitable and therefore appealing to a developer/distributor.

There are two other potential candidates for software licensing. One is a start-up company. Universities are finding that graduate students, especially, who have been involved in developing a unique software program as part of their graduate studies are sometimes interested in starting a company to market, support and enhance the software. Software spin-outs from universities provide a relatively low-cost opportunity for student entrepreneurs to get into a high stakes marketplace as opposed to developing a product from an early-stage patent. The other category of candidates for software licensing not to be overlooked includes established companies that are interested in finding new process, computational, or design software to reduce manufacturing time and costs, but do not have the capability to develop the software themselves.

4. Constructing the Software Copyright License.

(a) Identifying the Licensed Program. Because computer programs are often subject to revision, bug-fixing, or enhancement, it is important to accurately identify and define the version of the software that is the subject of the license. If the licensed "program" is too vaguely defined, the licensee may claim it is entitled to updated versions when that is not the intention of the institution. It is also important to identify the specific platform or platforms the license will cover. It is prudent to always keep an exact duplicate of the software delivered in case a question arises at a later time as to what was licensed and what was not. The license should also clearly identify whether source code or object code, or both, are being licensed.

(b) The Grant of Rights. Software protected by copyright may be licensed to permit the licensee to utilize the entire *bundle* of rights that comprise copyright protection (rights to copy, distribute, derivatize, display publicly, perform publicly) or a subset of them. Clearly, a software developer/distributor would need the right to copy and distribute. The right that requires the most consideration is the right to *prepare a derivative work*. A derivative work includes any modification, adaptation, abridgement and so forth, including writing the software program in another programming language.

Under copyright law, absent an agreement to the contrary, a derivative work authorized by the owner of the original work is owned by the author who derivatizes it. This means that a licensee, derivatizing software under a license that permits it, will own the derivatized software. The research institution, as the original owner of the software program retains all rights to the program as it was delivered to the licensee, but will not own or have rights to use the new pieces of code added by the licensee. In some cases, it may be possible for the institution to negotiate a right to use derivatized code, but most licensees will not be willing to let modified or enhanced versions of the software go back to the institution. To some extent, the institution loses control over its software when it is licensed out with a right to derivatize. However, most licensees, if they are developers, will argue that they need access to the source code and the right to modify, if they are to keep up with the changing needs of their customers. On the other hand, if the software is licensed only for end use, generally only under an object code license, then the end user needs neither the rights to copy and distribute (unless licensed to a site where multiple copies will be made and used throughout the site) or the right to derivatize.

The *granting* clause is also the clause that will contain the scope of the license; whether it is exclusive or non-exclusive; whether the right to issue sublicenses is granted and other limitations such as territory or field of use. There are two primary kinds of sublicenses: one that permits the licensee to issue sublicenses for end use and one that would permit the licensee to sublicense all of its rights to a third party. Since research institutions often develop software under federally funded programs, licensing professionals must be aware of the retained rights of the government. These rights are broader than the rights retained by the government under Bayh-Dole for patented inventions. They are contained in FAR Subpart 27.4, Rights in Data and Copyrights, Section 27.402 Policy.

(c) The License Term. The term of the license is not generally an issue under a patent license. Patent life covers a relatively short twenty (20) years from the date of filing (with extensions possible if the patent application is delayed in the U.S. Patent Office). Conversely, the term of copyright is exceedingly long. Assuming the research institution is the copyright holder, the term of copyright protection extends for a period of approximately 95 years. It is incomprehensible to think of a computer software program as having an effective life of 95 years. Research institutions commonly license software for the life of the copyright, meaning effectively, in perpetuity, particularly if an exclusive license is being granted. However, some consideration should be given to a reasonable license term if for no other reason than to get the license off the books of both the institution and the licensee at a point in time when the software will most likely be out-of-date. Another way to shorten a license term is for the institution to retain a right to terminate the license if the software is no longer being marketed by the licensee.

(d) Software Royalties. Royalty strategies applied to software licensing generally follow the same strategies as those used for patent licensing with a few significant differences. First, unless the software has been patented, there will not be a "reimbursement" for the costs associated with seeking protection. The current fee for registering a copyright in the U.S. is $20.00, and even this is not required to sustain the copyright. There is no registration requirement in other countries. Second, software royalty rates tend to be higher than patent royalty rates. This is generally because the licensee's development costs prior to getting software to market are presumed to be less and therefore the software is worth more when it is turned over to the licensee by the research institution. Third, because of the nature of software and copyright protection, licensees often receive peripheral rights that they would not receive if they were licensing a patent.

The right to derivatize the software has already been discussed. This is an extremely valuable right that permits the licensee to develop the software for multiple markets. It is completely appropriate for the institution to get a royalty return on a "derivatized" software product, but the university, when licensing, must remember that the derivative product will belong to the licensee, and therefore specific language should be carefully constructed to ensure a continuing stream of royalties to the institution even if with the passage of time the software product being marketed by the licensee no longer contains any code belonging to the institution. A final comment on software royalties reminds the reader that the fees earned by a software licensee from maintaining and updating the software are also income categories to which royalties may be applied.

(e) Other Terms. Other license terms are similar to those discussed in Section B for patent licenses. An issue not previously discussed but which should be considered by a licensor is whether to apply *trade secret* protection for software as well as copyright protection. This question arises generally under *source code* licenses, rather than *object code* licenses. As long as the source code is not disclosed to third parties (except under a non-disclosure agreement), source code can be protected as a trade secret. Unlike a patent, which is published to the world when the patent issues, copyrighted code is not necessarily published. It makes little sense for an institution to consider applying trade secret protection to source code in a license (by prohibiting disclosure by the licensee) if the software was developed under federal funding, due to the government's broad rights to release it, or if the university believes that students should be able to publish and otherwise disclose the code to third parties as part of their educational activities.

D. When the Disclosure is Multimedia

1. Identifying the Pieces of the Puzzle. Unlike patentable inventions or computer software, which have fairly distinguishable elements, a *multimedia* work is generally a collage of separately identifiable and often independent contributions. For example, a multimedia work disclosed to a TLO may include a computer program, a video, a digital archive, text content, recorded music, film clips, still images, just to name some of the possibilities. Prior to considering whether a multimedia work is a viable candidate for commercialization, the TLO must assemble all of the components and then determine whether the university has ownership in all, some, or none of the pieces. Unless the answer to the question of institutional ownership is "yes" to all elements of the work, the TLO must determine from the non-institutional owners whether it is possible to acquire sufficient rights to enable the entire work to be licensed into the marketplace.

2. Choosing a Distribution Vehicle. Similar to the case of some computer programs, the institution will be faced with making a decision as to whether the multimedia product, especially if it is an educational or learning tool, will be best distributed by a commercial publisher or software house, whether the institution's technology transfer operation is in a position to distribute the product directly to users, whether the department that developed it wishes to undertake distribution or whether the creator of the multimedia work will elect to take a license from the institution and start his/her own company. Perhaps the only new consideration to be added in the case of educational multimedia is an assessment of whether the licensee has the requisite technical expertise and reputation in the educational marketplace to effectively enhance and market the work. Since the marketable value of an educational tool is often dependent upon whether it has something new to offer, an assessment of the licensee's capability to add "bells and whistles" may become an important consideration in choosing a licensee.

3. The Licensing Process. If we consider a multimedia work often to be a collage or "collection" of separate elements or components, it follows that the various copyright holders or "authors" of the separate components may have different ideas as to the scope of rights they may be willing to grant to the licensing institution. Since the institution cannot license out better rights than it has, the scope of rights licensed must fall to the lowest common denominator, or, at a minimum, must set the license terms accurately for that piece owned by the contributor setting the lowest common denominator. While one can always

license lesser rights than one has, one cannot license greater rights than one has. It is not unusual, then, to have some portions of a multimedia work licensed exclusively and some non-exclusively to the same licensee. Or, a licensing institution may decide that the least complicated path is simply to license an entire work non-exclusively. The downside in doing so is that the license may lose value as a whole, rather than lose value only with respect to certain pieces. Rights to the various components not owned by the institution may be gained through an assignment from the owner to some or all of the copyrights, through a release to the institution (a promise not to sue), or through a license from the owner to the institution which is broad enough in scope to permit the institution to issue one or more tiers of sublicenses to third parties and beyond.

4. Managing the Licensing of a Multimedia Work. It should be obvious that the licensing of multimedia will often require employing a different set of considerations than other intellectual property products. Since the ability to license a product in its entirety depends upon gaining sufficient rights, there are most likely component licensing negotiations that will need to be held with the component owners (who may be faculty, students or third-party contributors) before licensing of the entire work can be considered. Determining the cost of securing the component rights may result in a complicated formula based on a predicted return on the sale of the entire work, divided by the "agreed upon" value of the component; or,

   it may be a percentage based on sales price; or it may be a flat fee assessed on each unit sold; or it may be based on any number of different strategies. The point to bear in mind is that the licensing in to the institution must be the pre-cursor to the licensing out. The licensing professional must ensure that all of the separate pieces line up so that a licensing out deal can be accomplished on better than a revenue neutral basis.

E. When the Disclosure is a Web-Based Product.

The licensing of web-based (or Internet) products such as digital archives, databases, learning tools, courseware and web pages intended for distributed learning environments is much like the licensing of multimedia products in that there is apt to be a tangle of separately protected elements (copyrighted and/or patented software, copyrighted text, images, film, new delivery technology that may be patented and more). And, there are additional considerations because the product will be distributed over the Internet.

1. Factors to Consider in Web-Based Licensing. The following is a sampling of factors that must be considered prior to distributing web-based material or products, either by direct institutionally-initiated distribution or by license to a third party.

   - Ownership of the various components of the product;
   - Whether content is libelous, defamatory, infringing, or violates rights of privacy or rights of publicity;
   - Accuracy of the materials and whether it will be important to keep the content current;
   - Distribution method, either openly accessible or controlled access;

- Consideration of risk that the institution may inadvertently become liable for infringing materials under the No Electronic Theft Act (P.L. 106-160) or the Digital Millennium Copyright Act (P.L. 105-304);
- What rights will be granted to users: rights to copy by downloading to computers and/or to print, rights to incorporate into published works, rights to modify, rights to archive; and
- If it is a web-based interactive course, rights to display student contributions.

1. Use of the Institution's Name. Both web-based and multimedia educational materials may derive significant market value from using the name of the university as a *branding* designation. While the use of the institutional name as a "brand" is a form of trademark licensing, it is distinct from sports indicia licensing or straight trademark licensing for non-educational products. The traditional product liability aspects that make straight trademark licensing a matter of balancing income versus risk become less important, while the overall "good will", integrity and reputation associated with the institution's name become more important. Before beginning the licensing of educational products, which inevitably raises the question of the use of the university's name at some point, it will be wise for the institutional academic leaders in conjunction with licensing professionals to consider when and how the institution's name will be used and who is the proper authority to approve its use.

VI. *Trademark Licensing*

A different type of intellectual property licensed by research institutions is *trademarks*. These may include the name of the university, a well-known symbol (such as the university dome or tower), the university mascot, and the names and nicknames of its athletic teams. Trademarks may also include certain technical or product identifying names and symbols which relate to new technologies or innovations developed by the university which will become known in the marketplace by their trademarked names. It is important to recognize that a trademark is a word or abbreviation that will be used to identify goods. It will be used as an adjective to indicate origin of the goods or services to which it is applied and to denote standardized quality for the goods or services bearing the mark. *Trademarks* and *service marks* are subject to the same rules and regulations, with the former applying to goods and the latter to services. Ownership rights for trademarks and service marks emerge when the mark is used on goods or services that are placed "in commerce". Trademarks and service marks are federally registered under The Lanham Act (15 USC §501 et.seq.). They may also be registered under state law and/or may be protected under common law.

A. Insignia licensing. Frequently, the university and athletic team names and logos are licensed out to be used as insignia on clothing, gifts, and other consumer objects, with no technology being transferred. In this case, the university license will be concerned simply with proper use of the trademark on appropriate objects, suitable royalties payable to the university, and indemnification obligations. The risk to the university of a properly run insignia program is relatively slight, and the royalty rewards for those universities with well-known and winning athletic teams can be substantial. Even for those universities whose income from insignia licensing is quite small, the program can be important in controlling the proper use of the name and preserving it from "trademark dilution" arising from unlicensed use by others.

B. Licensing of Technology-Related Trademarks. Trademarks licensed in conjunction with products or services that will reach the marketplace pose a danger of liability for the institution. Consequently, they are carefully managed. By law, a trademarked good implies that the owner of the trademark is responsible for the quality of the goods. An institution generally will not license trademarks for technology goods unless it can assure itself of the quality of the goods or has assurance that it, and its licensee, has suitable insurance protection if something goes wrong. In many circumstances, universities will either refuse to license a trademark or will choose to transfer the trademark outright to the technology licensee so it is no longer owned by the university. Like software licensing, trademark licensing has its own peculiar considerations. The most important of these are the quality control, packaging and advertising obligations and restrictions that must be followed by the licensee. The requirement to mark licensed products with the appropriate ® or ™ symbols is also important. And, institutions, especially those institutions that may be susceptible to liability suits, must ensure that licensees maintain adequate insurance policies. Royalties most often are negotiated as a percentage of sales and a license maintenance fee may be imposed.

C. Foreign Licensing. Some universities with significant name recognition earn substantial revenues from the foreign licensing of their trademarks. As in the U.S., in order to get sufficient protection for trademarks in foreign countries to carry on a trademark licensing program, the marks must be registered. Trying to administer a foreign trademark program without the protection of foreign registration would be difficult. Most institutions involved in foreign trademark licensing use licensing agents. There are several large companies that serve as trademark agents for licensing in the U.S. as well as in foreign countries. Generally, royalties earned are split with the agent on a negotiated percentage basis. Agents provide the benefit of having established contacts in the countries where they do business. They handle the direct licensing with manufacturers and offer some assistance in policing use of licensed marks. A current issue that universities engaged in trademark licensing are beginning to address as a matter of university policy is that of Fair Labor standards worldwide for workers engaged in manufacturing for trademark licensees.

VII. *Licensing Other Research Products*

This Tutorial focuses on patent, copyright and trademark licensing as the most commonly practiced forms of technology transfer by licensing at universities. However, research institutions are not restricted to these traditional forms. Other candidates for commercial licensing include:

A. Maskworks. Semiconductor masks (or chips) are protected by a special type of intellectual property. Registration is inexpensive and protection is similar to copyright although of much shorter duration.

B. Biomaterials. Certain types of reproducing biological materials may have significant commercial value either in product development research or in manufacture. These include transgenic animals, pieces of DNA, cell lines especially adapted for manufacturing proteins, and many others. As has been pointed out in the section on Patenting, these materials may or may not be patentable. If patentable, the institution may choose to patent or not to patent them depending upon a number of circumstances that have already been discussed.

Perhaps the most important consideration for those materials which are not patented but are useful as research tools is to weigh the importance of easy access for scientific research against the financial benefit from restricted access licensing, to make decisions which best fulfill the stated mission of the university.

C. Know how. The licensing of *know how* (the unpatented "how to" information that accompanies any scientific discovery or innovation) is not altogether common for research institutions, but neither is it unknown. Know-how is essentially a trade secret and, as discussed above, can be a formula, pattern, compilation, program, device, method, technique, or process that provides a competitive edge to a licensee. Importantly, a trade secret must remain unpublished in order to have value as intellectual property. Although not common, as a component of patent licensing, the licensing of *know-how* can be a critical factor in the successful transfer of technology as well as an important source of revenue for an institution. If a discovery is unpatentable, or perhaps is not patented worldwide because of a publication restriction, permitting a licensee access to the unpublished information that provided the roadmap for the discovery or innovation may be of sufficient value so as to warrant licensing consideration. The challenge for the licensing professional in deciding whether *know h*ow is actually licensable is to consider whether its value to a licensee can be maintained. Once *know how* becomes published, whether as part of conference proceedings or in a scholarly article or through delivery in a report to the government in the case of federally funded research projects, the value is diminished because accessibility is no longer restricted. Careful attention should be paid to defining *know how* in the license and the exclusivity of being granted. Additionally, the propriety of maintaining confidentiality of *know how* in order to protect its licensing value should be considered as a matter of policy or in practice by universities in light of their overall missions. Practitioners would be well-advised to seek intellectual property counsel when considering know-how licensing strategies.

VIII. *Managing Conflicts of Interest*

In activities that involve the *balancing* of interests of multiple constituencies within an academic institution such as inventors and authors, students, research sponsors, technology transfer professionals, and principal investigators, *with* the university's traditional missions of education, research, and public service, there are bound to be areas of overlap in which conflicts arise. The inter-relationship of the people and the diverse interests represented creates an environment where conflict is inevitable. The principles that academic institutions must protect most carefully are academic freedom, excellence in education, open and timely communication and dissemination of knowledge, and the reputation for integrity of research and service. Universities have become conscious of the need to apply some braking pressure in the form of conflict management procedures, disclosure requirements, and policies and guidelines intended to achieve an acceptable balance of interests.

Federal requirements requiring federally funded research institutions to maintain policies regarding conflicts of interest have been a fixture of the regulatory landscape.[2] To ensure the integrity of their research and address these requirements, the vast majority of research institutions have long established policies governing investigator conflicts of interest, Recently, conflict of interest and conflict of commitment have been in the spotlight once again as federal agencies have examined the issue of inappropriate foreign influence on research, and the

[2] *See 42 CFR Part 50, 45 CFR Part 94 and the National Science Foundation Grants Policy Manual 520, dated July 11, 1995*

investigator conflicts that arise in this sphere[3]. COGR has issued recent publications and presentations that examine conflict of interest and conflict of commitment, including an examination of these issues in the context of evaluating global engagements[4], as well as collecting links to examples of institutional conflict of interest and conflict of commitment policies[5].

IX. *Conclusion*

In spite of the complexities of university technology transfer, the successful efforts of U.S. colleges and universities and their faculty, research scientists and students has had a demonstrable effect upon the U.S. and global economies. While policies for each university or college will reflect the institution's unique faculty, student body, curriculum and institutional priorities, the principles, methods and goals underlying academic technology transfer are generally held in common. This commonality has permitted the U.S. universities to become a forceful catalyst for new industries, new company formation, new products on a global scale and new jobs for the U.S. economy.

[3] *See, e.g., U.S. General Accountability Office (GAO), "Federal Research: Agencies Need to Enhance Policies to Address Foreign Influence," GAO-21-30, (Dec. 17, 2020)*

[4] *See, "Principles for Evaluating Conflict of Commitment Concerns in Academic Research" (Jan. 2021); "Framework for Review of Individual Global Engagements in Academic Research" (Jan. 2020); "Foreign Influence on Research: Handling Cross-Cutting Issues" (slides from presentation at June 2020 COGR membership meeting – part I and part II)],*

[5] *See, https://www.cogr.edu/conflict-commitment-policies-cogr-member-institutions*