

Administration of Large and Small Technology Transfer Offices

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The objective of this chapter is to discuss the differences, and similarities, encountered in setting up and administering a small technology transfer office vs. a large one. For the purposes of this chapter, we will consider small offices to have less than three full-time employees (FTEs) devoted to licensing and less than a total of five FTEs including support staff.

In discussing these two types of offices, we will consider the inputs (such as mission, objectives, budget, research, and tools) required for managing the offices, along with aspects of how to organize the offices. In addition, we will consider expected outputs (such as revenues, service, and economic development) and how they impact the organization.

It's About the Mission

Naturally, the size of the office is almost exclusively based on the budget. Generally, the size of the technology transfer office correlates with the research base or overall faculty size of a university. The more you have to work with, the larger your office is going to be. However, an office setup should not be based solely on this relationship. The way an office is funded and subsequently budgeted should be firmly founded on the mission and overall objective of the university. Universities that recognize the transfer of knowledge in their overall mission statements have elevated the role of technology transfer in their objectives and often provide a higher level of support, both budgetary and administratively.

For example, the Massachusetts Institute of Technology's mission statement includes: "The Institute is committed to generating, disseminating, and *preserving knowledge, and to working with others to bring this knowledge to bear on the world's great challenges.*" [authors' italics]

The University of Michigan's mission statement includes: "The mission . . . is to serve the people of Michigan and the world through preeminence in creating, communicating, *preserving and applying knowledge, art, and academic values...*"

Johns Hopkins University's mission is: ". . . to educate its students and cultivate their capacity for life-long learning, to foster independent and original research, *and to bring the benefits of discovery to the world.*"

The mission is important not only at the highest level of the university but also in terms of determining how the office will be financed and structured and how it will operate day-to-day. This may sound obvious, but we have found that technology transfer offices are sometimes formed without a mission in mind or with a mission that doesn't consider all that's involved. Important questions include:

- Is the office expected to be self-supporting?
- Is service to faculty and staff more important than financial returns?
- Is the office responsible for nonrevenue generating activities such as material transfer agreements (MTA), sponsored research agreements, entrepreneurial activities, etc.?
- Is public service to the community part of the office's mission?

Unfortunately, it is not uncommon to have different units at a university believe in different missions for the technology transfer office; whatever its stated mission. A vice president of research, dean, chief financial officer, department chair, and faculty member may each have varying views and expectations for the technology transfer office, while only some of these groups may provide financial or administrative support to the office. Community leaders may also weigh in on expectations for the office and how it interacts at the local and state level.

It becomes the director's job to identify all of the stated (and unstated) missions for the office, make sense of them, and operate the office accordingly. It is, of course, paramount to do this when opening an office, but equally as important to periodically revisit the mission, even after years of operation. The mission may change with changing administrators and with a changing external environment.

To meet the mission's goals, one must have specific objectives in mind. Listed below are common objectives for technology transfer offices. This list is not meant to be all-inclusive, nor is it in order of importance, but rather is offered to stimulate thoughts on how you may come up with your own list.

Many of the items on the list conflict with one another. For instance, if the office is to be self-sufficient, then service to the faculty cannot be the most important criterion as an objective. To be self-sufficient, one will need to work within constraints of resources and say no to a faculty member more often than under a service criterion. Of course, service can be a lower, and subordinate, objective in such a case.

Common objectives:

- Provide the best return on investment.
- Become self-sufficient in X number of years.
- Increase research expenditures through industry funding.
- Reward, retain, and recruit faculty.
- Transfer technology for public benefit.
- Economic development (job creation).
- Facilitate startup company creation.

Objectives should state the desired position or perception of the office. It is important that the greater institutional administration agrees with the chosen perception. Many resources outside this manual are available to discuss the process of defining mission, objectives, and then how to follow objectives with measurable goals. Such a discussion is outside the scope of this chapter.

Each objective will have a set of measurable goals that define metrics that may be used by its constituents to judge the office. For instance, if the office's primary mission is to provide a return on investment, then a measure of revenues relative to the sum of patent expenses and operating costs might be appropriate. If the mission is primarily to transfer technology for public benefit, you may wish to focus on the number of license agreements with less concern for the amount of revenues those license agreements generate. As yet another example, if the primary mission is faculty service, then you may wish to track faculty complaints and compliments.

Later in this chapter, we will briefly discuss a number of office models based on varying missions and objectives.

How Is the Office Supported Financially?

Once the university determines where technology transfer fits within its overall mission, how it financially supports the office will follow. It is important to recognize that technology transfer office budgets are generally divided into two main areas: patent budget and salaries. It is not unusual for the patent budget to be treated separately from the overall salary and administration budget for the office.

Many technology transfer offices (or components thereof) are funded either in part or entirely from royalty revenues, while others are supported through general funds. Some tech transfer offices depend on contributions from university units such as colleges, so-called experiment stations, even departments or individual faculty accounts, although department and faculty accounts are almost exclusively for patent costs, while larger units may contribute all or part of personnel salaries.

Whether the university expects the office to be self-supporting varies greatly from university to university. From our experience, most university technology transfer offices are expected to be self-supporting in some form (for example, bringing in enough money to pay for all or most of the patent budget), even when not stated directly.

Most fail to be self-supporting. To understand why, consider the following. Venture capitalists plan on revenues that pay for their fund management and give the investors a

healthy return from about 1 of 100 deals that come across their desk. In a university environment, we deal with technologies that are much earlier-stage and don't have a business plan. Thus, our success rate may be an order of magnitude less than a venture capitalist.

Establishing self-sufficiency as a goal will result in differences in royalty distribution policies—namely, if the university expects the office to be self-supporting, a portion of the royalty revenues must go directly to support the office and only the resulting net revenues will be distributed (that is, a percentage of all revenues is taken off the top, prior to distribution).

It is our opinion that a university tech transfer office should never have self-sufficiency as a goal. Instead, the goals should be established around success metrics in licensing technologies and creating startups. As demonstrated by the *AUTM Licensing Survey™*, where less than 1 percent of licenses bring in \$1 million or more in royalties, it is often unrealistic to expect an office to be self-sufficient. Those few offices that are self-sufficient typically have one technology that has brought in a great deal of revenues.

Some offices, in particular those at public institutions, may receive funding from state agencies either directly or through grants targeted toward specific activities, for example, business formation in the state.

Reporting Location

While many tech transfer offices are a division or department of the university's research function, some universities house their technology transfer office outside of the university in a foundation (e.g., Wisconsin Alumni Research Foundation) or a for-profit related entity (e.g., Arizona State's AzTech Inc.). A few universities also support satellite offices dedicated to specific schools or colleges (e.g., Harvard's Medical School Office and Michigan's Engineering Satellite Office). An office may divide duties between a university office and a for-profit corporation, like Baylor College of Medicine Licensing Group, responsible for technology licensing, and BCM Technologies Inc., responsible for venture development.

Don't Forget the Faculty Research

As we said above, universities with sizeable research expenditures generally will have larger offices, although there are exceptions. Regardless of the budget of the office and the quality of the licensing and support staff, without great research (and, we firmly believe, faculty interest in technology transfer), the technology transfer office will have nothing to protect, market, and license.

The overall research expenditures only provide a clue, however, to the available disclosures or resources to the office. Some universities expend large amounts of research dollars in social research, history, the arts, and other areas that traditionally do not result in significant numbers of commercially valuable disclosures. Other universities with relatively small research expenditures may have larger number of disclosures because their research is directed toward more narrow or applied research areas, as opposed to broad, basic research.

It's important to understand one's university and its research base and faculty capabilities so one may organize the office to capitalize on this very important input. Obviously, if the university focuses on medical research, the office's licensing personnel should have a background in life sciences, while a land-grant university with strong agricultural and engineering research should have licensing personnel with the corresponding backgrounds.

Office Personnel

Technology transfer staff can be divided into the following general categories:

- licensing staff
- legal staff
- business development staff
- patent support staff
- accounting staff
- other (MTA, students, outreach, marketing, etc.)

Obviously, the size and budget of the office will determine whether the office employs people in some or all of these categories.

Licensing Staff

Licensing personnel are the backbone of the office. If an office has only one person in technology transfer, it must be a licensing person.

Overall, it is the job of licensing personnel to identify matches between industry needs and available technologies. Depending on the size of the office, licensing staff may be responsible for all prediscovery discussions with inventors, working with patent counsel on protection strategy, marketing, negotiating licenses, and maintaining postlicense accounts. This approach is often referred to as *cradle to grave*. In small offices, licensing staff may also be responsible for nonrevenue generating duties, such as MTAs.

In larger offices, licensing staff may be more specialized, allowing the staff to focus on only one or two aspects of the licensing process. For example, one group may be responsible for determining patent strategy and coordination with patent counsel, while others will be responsible for marketing and licensing of disclosures.

The most desirable licensing person has a balance of three important aspects: a technical background, a business background, and some knowledge of applicable law. The technical background enables the individual to communicate with faculty and understand the inventions. The business background is necessary to speak easily with industry and brings the knowledge of how to close a licensing deal. The knowledge of law helps in making sense of the intellectual property terms and the other contractual conditions.

Legal Staff

The role of university legal counsel as it relates to the technology transfer function varies widely from university to university and is not based on the size of the office. The two most important issues to be decided upon creating an office are: (1) will the office have dedicated legal staff (either physically on site or based at the general counsel's office) and (2) who will have signature/approval authority and oversight for agreements negotiated by the technology transfer office. In this discussion, the legal staff is typically most knowledgeable in contract law and has some knowledge of intellectual property law.

We believe having legal staff located on site or dedicated to the technology transfer office is a real advantage. When licensing and legal staff can work together on all aspects of the licensing process, both parties gain an understanding of the process, issues, and can develop practices for acceptable agreement parameters. This coordinated effort not only results in a more consistent approach to agreements, but may also speed up the negotiation, approval, and signature process. Several offices have also used their legal staff (or licensing staff if they have passed the patent bar) to file limited numbers of patent applications in house.

Other valuable uses of legal staff include: development of agreement templates, management of litigation, assistance with patent strategy, interpretation and development of policies, and a wide variety of problem-solving relating to the technology transfer function (such as inventorship reviews and controlling/monitoring outside counsel). In-house legal staff may also file copyright and trademark registrations where appropriate.

Because of the variety of technologies created at universities, almost all universities employ outside firms for their patent work. In this way, they may select outside counsel familiar with the technology area. As more universities become involved with faculty startups, legal counsel familiar with equity agreements and corporate transactions also can be very valuable to the technology transfer office.

Universities without dedicated legal staff may be required to use outside counsel that can be expensive and may result in the office only asking for legal help on big agreements. Alternatively, the office may be required to obtain legal advice from university attorneys not well-versed in intellectual property and the business risks associated with negotiating and entering into license agreements.

Some universities require that legal counsel review and sign off on all agreements. Generally, this will add time to the overall agreement-approval process and may create friction between the technology transfer office and the general counsel's office. In these instances, it is important for the offices to work well together and to have consistent and clear guidelines for agreement parameters.

Business Development Staff

Universities (both public and private) have become more interested in promoting the commercialization of university technologies through startup companies that may provide direct benefits to the community and to the state. How the office (or university as a whole) assists faculty entrepreneurs in creating startup companies varies greatly, however. While startups have the potential to produce significant opportunities for the inventors, the university, and the surrounding community, such projects involve more work and are riskier than a traditional license to an existing, capitalized company.

Some offices have in-house business-development staff dedicated to working with faculty as they consider startup opportunities for their technology. These staff members may provide assistance in a number of activities including: business planning, market analysis, identification of venture financing or other investments, regulatory planning, management recruiting, and other business formation activities. Generally, business-development staff do not negotiate licenses or interact with patent counsel, so it is important that they interact with the licensing staff to ensure a consistent commercialization approach to a particular technology or technology portfolio.

Legal Support Staff

Legal support staff have responsibilities similar to paralegals or administrative assistants in patent law firms. Their principal function is to maintain and manage all information relating to patents and disclosures. For example, they typically will manage the office's database by inputting all new disclosures and information on patents (application date, serial numbers, office action status, law firm, etc.).

In addition, legal support staff will manage all government reporting (for instance, the National Institute of Health's database (iEdison) and any foundation- or state-required reporting), and all associated paperwork (titles, assignments, declarations, etc.). Depending on the office, legal support staff may also interact directly with licensees and outside counsel on relatively routine patent maintenance issues such as selection of countries going to national phase, restriction requirements, payment of annuities, etc.

In offices large enough to support this function, legal support staff provide an invaluable role by enabling the licensing staff to focus on marketing and license negotiations.

Accounting

No matter what the size of the office, it is important to have at least one dedicated staff member to handle accounting, even if borrowed from another office. This position is responsible for receiving (and sometimes reviewing) bills from outside patent counsel (and other vendors, such as consultants) and recording the data and billing licensees. Collection is an important and time-consuming aspect of this function. Licensees, in particular, small or startup companies, often will pay the university last in their lineup of bills, if at all. An office's accounts receivables can expand rapidly if the accounting personnel cannot keep up with monitoring the office's accounts.

In addition to collections and billing, the accounting function is responsible for receiving royalties and for distributions to inventors, departments, colleges, and other administrative units. Inaccurate or slow distribution of royalties to inventors can be disastrous to an office's reputation and ability to expand its reach to new inventors.

The accounting function also will work with the office administration (and/or legal support staff) for periodic reporting of metrics used by the office to measure success, such as number of inventions disclosed, number of license agreements closed, royalty income, and research funding that is intellectual property induced. Timely reporting of office metrics provides useful information to all university (and outside) stakeholders.

Other Staff or Student Assistance

Some offices employ one or two staff solely to manage and complete incoming and outgoing MTAs. Negotiating terms in MTAs, assisting faculty, organizing large numbers (often hundreds per year) of transactions, and dealing with colleagues at industry and other universities provides experience that can then be used in future licensing endeavors; thus, these are good positions in which to teach those interested in becoming licensing associates.

Many universities employ students (either paid student workers or as unpaid interns) to assist in a variety of endeavors. Student staff may be undergraduate as well as graduate students in the sciences or from a university's business school. Examples of common uses for students are: market research, outreach to faculty, and creation of marketing documents (nonconfidential disclosures, Web-site brochures, etc.). They are also useful for special projects, like characterizing research specialties or surveying constituents.

Today, many graduate-level students are interested in participating directly in the entrepreneurial aspect of technology transfer. At Michigan, the TechStart Internship Program provides internships to graduate students from the business school, engineering, medicine, law, and school of information. In this program, approximately one dozen students work in small, multidisciplinary teams on technology transfer projects, with input from the technology transfer staff, faculty inventors, and industry mentors. The TechStart program has its own office space and has funding from the technology transfer office, the business school's Zell-Lurie Institute for Entrepreneurial Studies and the Michigan Economic Development Corp.

At Texas A&M University, teams of four or five MBA students compete each year in a Technology Transfer Challenge. The MBA Technology Transfer Challenge encompasses one week each year in which all the first-year students of Mays Business School MBA program compete in the development of commercialization assessments for technology disclosures supplied by the technology licensing office.

Student teams undergo brief training exercises and draw prescreened Texas A&M System technology disclosures (nonenabling) out of a hat. Their challenge is to, in approximately eight days, develop commercialization assessments for the technologies and prepare a formal presentation on their assessments. On the morning of the challenge, one-hundred to one-hundred-fifty judges arrive on campus, drawn widely from the entrepreneurial and corporate business communities. The winning team receives a cash prize of \$3,000.

These are innovative ways to involve students for educational purposes and still may get a work product that the technology transfer office can use.

Other Inputs

Although the majority of an office's budget is spent on salaries and patents, other inputs can be quite helpful to the large or small office. Perhaps the most important is an electronic database used to track disclosures, patents, and accounts.

Unlike ten years ago when offices had to pay to create and program their own databases (or maintain accounts by hand), a number of commercial databases are now available that have been designed specifically for technology transfer offices. Generally, these databases require an upfront payment and then an annual maintenance fee. Some may be modified to suit the particular office's needs.

Other tools that can help an office include subscriber market-research databases, miscellaneous journal subscriptions, and venture/investment databases.

Office Models

As discussed at the beginning of this chapter, prior to staffing and organizing an office, the overall mission and objective must be defined. There are three main models for tech transfer offices:

- revenue generating/self-supporting
- service model
- focus on business development

Of course, most offices employ on a combination of all three of the above, but usually one of the three is the focus and results in the main strategic direction for the office and its staff.

Revenue Generating/Self-Supporting

The financial success of some technology transfer offices in the late 1990s and early 2000s was not lost on university administrators across the United States. A few offices that brought in tens of millions of dollars created expectations in many universities (by faculty and administrators) that all it would take to obtain similar revenue would be to startup a technology transfer office and start collecting royalties.

Of course, the *AUTM Licensing Survey* has shown that not only are very few licenses bringing in millions, but the majority of offices that bring in significant royalties have also been in business for many years. Statistically, only 1 invention in 8,000 reported brings revenues of more than \$20 million annually (known in the industry as a *home-run hit*). That said, it is not unusual for an office to have revenue generation as an important metric for measurement of its success.

If, in fact, revenue generation is a principal objective of the office, the licensing staff will have an incentive to select and focus their efforts on disclosures that appear to have the largest market and near-term commercial potential, while spending less time on disclosures with smaller markets. Because many successful inventions come from serial inventors, the licensing staff may also focus on providing service to the minority of faculty with a successful track record.

If the office is required to be self-supporting, it will be common to have disclosures reviewed and, at the outset, those deemed to have less revenue potential closed or offered for reassignment back to the inventors. Licensing staff will primarily be measured on the revenue generated by the office as a whole and by the number of agreements generated from their disclosure portfolio.

In addition, certain service aspects of technology transfer (assisting with MTAs, questions on intellectual property, copyrights, etc.) will generally be treated with less importance by the licensing staff.

In this model, the revenue-distribution policy likely will provide a percentage of all revenue to the office (often 15 percent to 33 percent off the top) or provide for the office of research (or main reporting unit) to maintain a percentage of all revenues for support of the office. The office will manage its patent expenses to a strict budget based on expected revenues. Often these offices will also be dependent on obtaining partial support for patent expenses from faculty accounts, departments, and other university units.

An interesting alternative to this income-based model is one that measures additional research funding as supplemental to royalty income. This model focuses on formulating

new university-industry relations and uses as a measure of success any sponsored research in which intellectual property is a major factor. This is referred to as intellectual property-induced research funding.

Service Model

If service to the faculty (and, in some cases, community) is the principal objective of the office, the focus for the staff will be to review all disclosures on an equal basis with an attempt to market and license all that have some commercial potential. In these offices, research tools (cell lines, vectors, plasmids, etc.) that bring in thousands or tens of thousands are considered just as important as the rare therapeutic compound that has the potential of bringing in millions of royalty revenue.

Licensing staff in these offices will be measured not only on the number of agreements, but also on numbers of disclosures coming into the office, numbers of faculty (in particular first-time inventors) they work with as well as number of complaints (and kudos) received from faculty and administrators. It is not uncommon to find licensing associates working on a license agreement that bears no financial terms in this type of office; for example, a license for open-source software.

Royalty distribution policies for these offices may still require a percentage of royalties in support of the office, but often only in support of the patent budget, while staff salaries are paid from the general fund or from the annual budget of the reporting unit.

This model promotes the retention and recruitment of faculty. It assists in bringing in and keeping talented and entrepreneurial professors and researchers.

Business Development

A focus on business development will require a slightly different mix of staff. In particular, staff with entrepreneurial experience will need to be available and highly visible to the faculty inventors. Staff will also work closely with the local venture/investment community (if there is one) and maintain relationships with local entrepreneurs, consultants, and other service providers (accountants, lawyers, etc.) that are familiar with the needs of startup companies.

But, you can't launch a new venture without a license to the technology, so the business-development personnel must be in addition to the licensing professionals found in the other office models. This office is likely to work on a smaller number of deals than any other, but devote a great deal of time to each.

In universities where business development is the prime objective, the technology transfer office may be located outside of the university or may involve a separate entity that focuses on developing university technologies that can be used to create new companies. The inherent arms-length relationship between the two groups lends itself to better management of potential conflicts of interest.

Small vs. Large Offices

While all of the above information applies to both small and large offices, small offices will be constrained by their budgets. The office may be started with a grant or budget from the vice president for research.

Small offices often are very creative in terms of finding resources, both financial resources and personnel resources from other university offices. It may be possible to attract an endowment from an alumnus that is a successful entrepreneur, for instance. Or, one might find a private entity that would provide upfront capital for patents in return for a very small return from all revenues generated by those patents. Another creative method would be a pay-as-you-go approach, where a department or college pays a certain amount for supporting each disclosure coming from that entity.

A small office may be able to use other university units to provide other support. For example, the university's fiscal office may be able to track revenues and cut checks for patent expenses and distributions of income. They may be able to help with annual budgets for operations and related reporting. However, it is not likely that they will be familiar with invoicing for royalties and monitoring license-agreement compliance. Even in a small office, it is best to have one person who can work closely with the fiscal office, but perform additional duties such as invoicing, collecting and distributing royalty income, and

patent-expense reimbursements. Thus, this person should have bookkeeping skills and have good phone communications skills.

Naturally, the small office should have at least one licensing person who can carry a project from disclosure of invention to closing a license agreement. Commercial assessment could be handled by one of any number of private-service companies that offer such assessments for a fee. If, in fact, the office has budget for only one licensing person, this person will need to be a technology generalist, able to work on a variety of both life- and physical-science disclosures. This person may also be the director and will be required to represent the office internally as well as to the outside community.

In small offices, decisions on patenting may be made either with assistance from outside counsel or by patent committees formed in the university units providing the majority of disclosures.

In contrast, large offices have the luxury of being able to hire a variety of licensing and other support staff as previously outlined. The office may be able to delineate different marketing and licensing strategies by technology area. For example, marketing life-science technologies may work better with a functional or categorical division of labor, while physical-science projects may not fit as easily into categories and require a cradle-to-grave approach.

Life-science projects can be segmented and categorized into a dozen or so areas. Each area has a growing, but limited number of companies that serve it. An office may compartmentalize licensing people in the life sciences by having one person to perform assessment, another marketing, and a third contract negotiations, for instance.

Since markets for many physical-science technologies are very mature, the market has segmented to a great extent. Thus, the intellectual property manager must learn a new market, served by a new set of companies, for almost every invention. Therefore, a cradle-to-grave strategy may work better for these technologies, where an invention is matched with the person closest in discipline. Each manager in this model takes his or her project from assessment to the closing of the deal.

In large offices, the licensing staff can be served by a matrix of support services handling patent prosecution and maintenance, fiscal services, and contract-compliance issues. An office manager might oversee the infrastructure needed for these operations. In addition, the director will play a much more political role than his or her counterpart in a small office.

In Summary

Whether considering opening an office or reviewing an existing office, the mission will guide the funding and staffing. It is paramount to have a clear mission, in particular, one that doesn't have conflicting goals and objectives.

Certain basic skills are necessary to conduct technology transfer: licensing, legal, business development, patent support, and accounting. A small office can leverage many existing resources to conduct the functions, whereas a large office can specialize.

There is no one or right way to form or operate an office. With an organized and thoughtful approach, one may create a structure that best suits one's university.