
[Plenary Speech I]

「Technology Transfer : Achieving Balance in New Ways, Old Ways and Always」

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It is important to speak of technology transfer as a profession in balance because a university environment is different from the business world. I will talk about my organization, AUTM, the world of academic technology transfer, some emerging themes beyond patent licensing, competition, and relationships with industry. Within a university or academic research environment, technology transfer's goal is impact through directed effort, emerging models include broad IP management including patents and beyond. There is no single technology transfer model, which leads to tremendous creativity in our practitioner communities.

AUTM is a professional association of about 3500, interested, supportive, global, academic technology transfer professionals. We are located predominantly in the United States. We have many Japanese members. In our annual general meetings, while participation of those with United States presence is first, the next is from those being Japanese. About 65% of our members are academic institution affiliated and 35% profession or industry affiliated. We attempt to bring a forum of professionals together to discuss and educate on technology transfer. Our professional activities include professional development through conferences, courses, and the like, service to our members, and advocacy for the profession in various forums. With sister organizations, AUTM is taking a strong stance in the current debate on patent reform to achieve a balance in what is being changed. We can support many changes, but some are concerning to our members.

Our core activities begin with the consolidation of intellectual property rights, creation of clear ownership, title, and management of the process. In a university, ownership is not always as clear as in a corporation. After creating patent or other rights, we use those rights in creating relationships through licensing contracts which allows knowledge and expertise to move to an organizational recipient. For us, those relationships are opportunity sources. So, one might think of our activities in the simple paradigm of rights to relationships to resources for doing better or more within our institutions, while making useful things available to the public through our partners.

Our goal is to create and extend research and education's impact for our institutions and the society served. Educationally, it is teaching to organizations as opposed to our standing tradition of teaching to students. A very important aspect and common tool is patents. It is a strong right in terms of market power and perception of usefulness. It requires funds to perfect and uncommon expertise. A patent is expensive. In certain ways, it is easier to systematize within many organizations, which is an opportunity and a limitation. People begin to think of the patent as the technology separate from other activities

and information, but we must keep a balance in our perspective and watch carefully that we do not confuse a tool with the work to be performed with that tool.

An academic technology transfer person must first achieve a balance of social and financial returns. A university is a social enterprise with business constraints, but not a business enterprise with social constraints, and therein lies a huge difference in function, purpose and perspective. Many things that we do comprise outreach for social impact and require investments, but these things do not provide a return. Traditional research and education, without the support of the prefectures or national government, are a net loss to the institutions. The role of Government and community in supporting that activity as a social good is tremendously important.

Of course, we have some profitable activities like MBA courses and other professional development education, and perhaps even certain aspects of licensing. But it is not really the financial returns that drive our activity rather it is the impact from them created by not only our universities but by the licensing partners. It is the partnership results that provide our societies and the people supporting our institutions true benefit. For example, the Honeycrisp apple, blood diagnostic chips, drugs and delivery systems like Taxol and the nicotine patch, microchips, lightning detection sensors for management of the flight of airplanes, Google, and advance weather warning software are all outcomes of a very complex system surrounding the commercialization of academic research. These represent the true impact of our efforts. .

Some of the elements in the technology transfer ecosystem can be identified. We have teaching and research and university technology transfer from academic or research hospitals, but that is not sufficient. We need service providers, entrepreneurs, capital sources, regional development authorities, existing companies, and creative class factors in our communities to complement and interact with that academic portion of the system. Of course, there are also local government and national government, and the research funding that they provide, to help drive and contribute to the ecosystem. But these elements all interact in complex ways. Therefore, in a university as a social institution, it is subject to various pulls by different audiences that make up that society and the innovation ecosystem.

Our core activities are IP management. Our community and our government may want economic development and strong relationships with industry. Industry may want something completely different. So the pulls between our core activities and what our various audiences desire is a balancing point between economic benefit, social benefit, and internal and

external community. For a business, this is very simple because they can be totally economically focused, but a university may have pressures for technology transfer that maybe span a range of models from an institutional profit or loss operation, to one concerned only with economic growth activity, to technology transfer as a community service. Our reality is we operate in a combination of these views of our activities.

Again we much reach balance. In a purely patent approach, what is the role of a not-for-profit? For example, SharMoore Children's Productions is a start-up out of the University of Arizona, which brings validated K through 6 literacy programs to our schools. Universities are very good at creating new teaching programs, but are not designed to bring them to further use in the thousands of schools in our regions. However, not-for-profits are very good at doing so and also good for economic development. It will not necessarily return any money to the university, but a big impact will be created for our society and for the institution. Therefore, we do and should consider and spend time on such activities in balance with the needs of our institutions and the societies they serve.

Academic technology transfer is an emerging view of activities as relationship building and appropriately adding value. This requires a broader view of intellectual property rights management. We must consider copyright, trademark, bailment, technical information, and patents. The goal is the same, support our institutions' societal impact and benefit the people supporting them.

If we are in an information-based society, then we must look at a university from an information-based perspective. So a university's research mission is to create, organize, validate, and disseminate knowledge in the form of information, and technology transfer is a part of it because it is a form of knowledge dissemination. It is clearer when we think of what emerges out of research: talented people, prototypes, design specifications, data, research products, R&D infrastructure and much more. These things can be tagged with intellectual property rights. Thinking of the broader information around research, we have a clearer picture of how to construct new motifs for technology transfer and licensing and of what is possible.

Creating relationships through licensing for the adoption of a new technology requires careful consideration of the patterns of adoption required in a given circumstance. We realized from our failure to license the patents in one case that we should have given the corporations approached the opportunity to learn the technology and adopt it to their needs, that is, considered how to use the information base to teach what we knew and to create opportunity for follow-on activity. Under a form of license, we could have put together our design codes, reactor designs, operating protocols, or existing data into an information asset and taught our potential partners, given them a research patent right, and agreed to standstill from further licensing for maybe 3 or 4 years while they examined and played with the process tagged by our patent rights. We could have had our faculty have a creative relationship with them by doing an on-site short course, and also done some consulting within this context. It would have paid for the technology to be

adopted and helped us support the creation of the patent rights for further use by our partners in deploying the technology in a capital intensive environment.

Usually, technology transfer attempts to drive things up to the top of the organization through the technology transfer office, and then down into the business units and projects group of a company. On the other hand, consulting with our faculty is peer to peer. Peer-to-peer activities in product development and new technologies are extremely important. When I was in the private sector and in charge of my company's product roadmap, we looked ahead 3 to 5 years trying to figure out how to fit in technology. Many university or academic technologies need to be utilized to figure out where they would fit into such a product roadmap. They have to be brought in at a different level than the top of an organization. The idea of teaching in a licensing relationship allows one to consider how one might use technology transfer to establish peer-to-peer relationships. Here we seek a new balance in technology transfer: this time in models and approaches to outside organizations.

It is important to work with existing companies. Working with small and medium enterprises is difficult and this is a place for the role of government and special programs, because small companies have neither the resources often to find the appropriate match into a university, nor the resources necessarily to afford to work with the university. Remember, universities tend to be very project-based, and outside funding, though not paying for the research totally, is an important contributor to making it possible. Academic research institutions typically have no excess resources to invest unless those are provided by the government or special programs.

When working with the industry, relationships are very important and without them the understanding of the different organizational business structures and other factors so important to make licensing possible are not there. A real issue for companies in doing research with universities is always going to be the basic value proposition and a reasonable and non-discriminatory access to the intellectual property generated under the effort. At the same time, if universities are part of the innovation supply chain, then suppliers need to be rewarded, especially if research is done on a cost not price basis. While it is short-term advantageous to push off costs to a supplier, in the long-term that supplier either must raise prices or go out of business. In a world where government support is becoming more constrained, this is a real concern.

In working with universities, companies must remember there is difference between a university or an institute's role in society as broadly supporting an industry and just supporting a company within that industry in a sponsored research relation. Therefore, licensing patents must be carefully considered to balance giving competitive advantage to a company with the institution's societal role of supporting the industry, the general economic good, and the society it serves.

As we look to emerging themes, among alternative approaches is leading with technology transfer not as a product but as a form of teaching and organizing the knowledge into more useable forms for an outside audience, such as industry. But it

takes time, effort, and resources to do so; technology transfer via intellectual property licensing can help create the framework and resources for such sustainable efforts. In these efforts it is using intellectual property to manage this activity, to structure the relationship, changing when possible the transfer point from organization-to-organization to peer-to-peer, and targeting, in a sense, market and opportunity creation. It is getting people to use the technology in order to validate that it has utility and a fitness for purpose, and using those relationships then to increase our information and further the dissemination.

In all of this, we need balance; and one of the balances that we must always keep in mind for academic technology transfer practitioners is the balance of purpose. We do this by keeping an eye on the outcomes we seek. The outcomes that we look at are the outcomes of the products and services that our business partners bring into use from our research that benefit our society and the people within it. In order to help others see this balance as we see it, AUTM has begun, in the last 3 years, an on-going project of capturing the outcomes, that is, the stories of technology transfer. This is the human face of technology transfer. The purpose is to help people focus on the outcomes that we all hope to achieve, whether it is changing the world for the better, building stronger economies, or helping people throughout the world by advancing treatments for neglected diseases. In conclusion, I wish you all to consider new and old ways to achieving balance in technology transfer and to use your creativity to create new models for patent and other licensing.