Intellectual Property Clustering

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Introduction

Every university has them: numerous pieces of intellectual property (IP) that remain unlicensed and may never be fully exploited. As a large percentage of university patented and unpatented IP goes unlicensed, IP clustering is a viable option in addressing this problem. Tapping into even a small portion of the value of this otherwise unlicensed IP can bring new licensing revenues into university technology transfer offices and fulfill the missions of many such offices by transferring technology from the laboratory to the market for public benefit. Clustering IP can create a new, more marketable and valuable product with which to approach corporations and investors. There are several variations on IP clustering, each with their own processes and challenges.

IP Clustering: Variations

While there is no agreed taxonomy for IP clustering methodologies, we have chosen to group them into four categories: patent pools, IP portals, IP bundles, and IP aggregation. Each will be outlined in further detail below—examining its characteristics, current examples, and considerations for its use. It is worthy to note that this is a very dynamic field with evolving practices and players coming and going on a regular basis. This is an indication that the field of IP clustering is still in its infancy with many changes likely to continue as new practices are tried and reformed.

Underlying the need for IP clustering is the desire of both IP owners and users to efficiently operate in an increasingly complex environment. The explosive growth in filing of patents over the past thirty years by an increasing number of organizations has lead to IP fragmentation and the creation of "patent thickets," which occur when multiple organiza-

tions each own at least one patent that is collectively necessary for the exploitation of a particular technology. A dense web of overlapping intellectual property rights, which it must get through in order to commercialize a new technology, confronts a company that wishes to develop a technology.[1] Potential users of IP are confronted with the unwieldy task of identifying the owners of technology-enabling IP and negotiating access through agreements with multiple parties.

The providers of IP, often academic institutions, are confronted with identifying potential licensees and enticing them to negotiate a license when the providing institution can only provide one piece of a very complex IP puzzle. IP clustering is used to ameliorate the challenges of both the IP providers and the IP users by making it easier to identify the IP of interest and reducing the transaction costs by making IP available from multiple providers through a single license agreement with standardized terms.

Patent Pools

A "patent pool" is an agreement between two or more patent owners to license one or more of their patents to one another or third parties. Alternatively, a patent pool may also be defined as "the aggregation of intellectual property rights that are the subject of cross-licensing, whether they are transferred directly by patentee to licensee or through some medium, such as a joint venture, set up specifically to administer the patent pool."[2]

Patent pools are not a new idea and were widely used in the late nineteenth century for industries such as sewing machine manufacturing. In the early twentieth century an aircraft patent pool was privately formed, encompassing almost all aircraft manufacturers in the United States. In 1924, an organization first-named the Associated Radio Manufacturers and later the Radio Corporation of America, merged the radio interests of American Marconi, General Electric, American Telephone and Telegraph (AT&T), and Westinghouse leading to the establishment of standardization of radio parts, airway frequency locations, and television transmission standards.

In recent years, patent pools have solved both research and development (R&D) (upstream) and access (downstream) problems. The pool may involve simple cross-licensing among two or more competitors in order to share a handful of patents necessary for the manufacture and sale of a particular product. Or it may involve a large industrywide pool

open to anyone, encompassing hundreds of manufacturers and thousands of patents, as well as other IP, such as rights to use data, know-how, or trademarks. Commons and IP clearinghouses are alternative names that are used to describe pools. Pools usually offer standard licensing terms to licensees and allocate a portion of the licensing fees (royalties) to patent owners according to a pre-set formula or procedure.

Patent pools take many different forms and are organized in response to a particular set of policy objectives and circumstances. There are pools that manage the patents on standards for new information technologies, that enhance R&D for new biomedical or biotechnology agricultural products, or that seek to promote social objectives. Some pools are organized by patent owners, others by manufacturers, and yet others by nonprofit institutions, including governments. Examples of patent pools organized for similar purposes include:

- promotion of standards
- innovation
- social benefits

While each differ in terms of its primary objectives, organization, and administration, all share the common benefits of addressing issues related to blocking patents and patent thickets, reduced transaction costs through a single published licensing process and reduced litigation exposure, and institutional exchange of related technical information.

The law regarding patent pools has changed dramatically over the last century. Antitrust laws and patents have often been in conflict, especially where patent pooling or patent cross-licensing is concerned. A patent is a government-granted limited property right to exclude others from making, using, or selling the patented invention. Antitrust laws, such as the Sherman Act, however, were designed to prevent the creation of monopolies and restraints on interstate commerce. Although these laws seem to be incompatible, both antitrust law and patent law are aimed at encouraging innovation, industry, and competition.

In 1995 the U.S. Department of Justice (DOJ) and the Federal Trade Commission (FTC) issued the *Antitrust Guidelines for the Licensing of Intellectual Property* (guidelines)[3] and specifically addressed the topic of patent pooling. In particular, the guidelines state that IP pooling is procompetitive when it:

- integrates complementary technologies,
- reduces transaction costs,
- clears blocking positions,
- avoids costly infringement litigation, and
- promotes the dissemination of technology.

The guidelines also discuss that excluding firms from an IP pool may be anticompetitive if:

- the excluded firms cannot effectively compete in the relevant market for the good of incorporating the licensed technologies,
- the pool participants collectively possess market power in the relevant market, and
- the limitations on participation are not reasonably related to the efficient development and exploitation of the pooled technologies.

In 2007 the DOJ and FTC issued a joint report entitled *Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition.*"[4] This report highlighted several key issues of potential concern when it comes to certain IP pools. Primarily the agencies highlighted that IP pools should be composed of complementary IP rather than substitute IP in order to reduce the risk of price-fixing, and participating institutions should retain the rights to license their IP outside of the clusters to encourage continued innovation.

Standards-Based Patent Pool

MPEG-2 (http://www.mpegla.com/main/programs/M2/Pages/Intro.aspx) was formed in 1997 by the trustees of Columbia University, Fujitsu Ltd., General Instrument Corp., Lucent Technologies Inc., Matsushita Electric Industrial Co. Ltd., Mitsubishi Electric Corp., Philips Electronics N.V. (Philips), Scientific Atlanta Inc., and Sony Corp. (Sony) to jointly share royalties from patents that are essential to compliance with the MPEG-2 compression technology standard.

Innovation Patent Pool

The Open Invention Network (OIN) (http://www.openinventionnetwork.com) was formed as a collaborative environment for using the Linux system. Patents owned by the OIN are available royalty-free to any company, institution, or individual that agrees not to assert its patents against the Linux System. The OIN aims to ensure openness of the Linux source

code, so that programmers, equipment vendors, and institutions can use Linux with more freedom to operate around IP issues.

GreenXchange (http://greenxchange.force.com/vGXhome) is a project of Science Commons with the intent of creating an open innovation platform promoting the creation and adoption of technologies that have the potential to solve important global or industrywide challenges. The goal is to encourage patent holders to make their patent portfolio available for licensing through public license offers that are offered to everyone on reasonable terms, while retaining the defensive benefits of patents.

GreenXchange proposes the following principles for patent licenses:

- The terms and conditions of the license should be made public and openly available for all to read.
- The offer is valid and complete, so that anyone who can agree to it is empowered to accept without further negotiation.

Patent owners are encouraged to make their patents available for licensing without fee or with only a nominal fee and with few or no field-of-use limitations. GreenXchange is proposing a patent nonassertion statement that creates a voluntary research exemption, permitting nonprofit research use by anyone, to help mitigate some of the effects of the narrowing of the experimental-use exception by courts.

Social Benefit Patent Pools

The Golden Rice Initiative (http://www.goldenrice.org/) is based on a line of rice that has been genetically engineered to produce and accumulate vitamin A (i.e., beta-carotene) in rice grains. This humanitarian initiative has the potential to save hundreds of thousands of children and women per year from vitamin A malnutrition, particularly in developing countries where it can lead to conditions ranging from blindness to death. This scientific breakthrough would have remained an academic exercise if a public-private-partnership and patent pool had not been created for product development and deregulation. The inventors and owners of ancillary technologies needed to develop the rice have provided the patent pool with a free license for smallholders in developing countries. Thus, farmers

in developing countries meeting the threshold requirements will be able to consume their produce, sell it, and replant the seed.

SARS IP Working Group

In 2005, there was a proposal to create an upstream pool to address R&D for a severe acute respiratory syndrome (SARS) vaccine. Following the outbreak of SARS, many research institutes and private firms rushed to sequence the SARS genome and apply for patents. The WHO SARS Consultation Group and key SARS IP owners created the SARS IP Working Group, which found that R&D would be delayed and constricted by the multiplicity of patents and that this would adversely affect the development of a vaccine. The group suggested that a patent pool be developed to promote the development of a treatment or vaccine. The creation of the pool was pursued by the IP owners but was ultimately abandoned after the SARS threat subsided. For more, see http://www.who.int/entity/bulletin/volumes/83/9/707.pdf.

GSK Patent Pool for Neglected Tropical Diseases (NTDs) in Least Developed Countries

The GSK Patent Pool for Neglected Tropical Diseases (NTDs) in Least Developed Countries (http://www.gsk.com/collaborations/patentpool.htm) was established in 2009 to encourage development of new and improved cures and treatments for such diseases. This patent pool targets sixteen diseases. The pool includes GlaxoSmithKline's current patent filings on small molecule pharmaceuticals to treat NTDs (approximately eighty patent families, which include more than 500 granted patents and more than 300 pending patent applications). The pool is administered by BIO Ventures for Global Health (http://www.bvgh.org). In July 2009, Alnylam agreed to contribute more than 1,500 issued or pending patents on its RNA interference technology patent estate to the GSK patent pool, and in 2010, MIT agreed to contribute patents to the pool.

Eco-Patent Commons

The Eco-Patent Commons (http://www.wbcsd.org) initiative is an IP clearinghouse intended to facilitate sharing and accessing of IP rights, mostly patents, relevant for environmental technologies. In January 2008, four companies, namely IBM Corp., Nokia, Pitney Bowes, and Sony, in conjunction with the World Business Council for Sustainable Devel-

opment, launched the Eco-Patent Commons. The commons is open to any company that contributes at least one patent that pertains to technologies having environmental benefits. Examples of activities that the commons considers as environmental benefits include energy conservation or efficiency, materials reduction, or increased recycling ability.
For a representative survey of patent pools, see "Survey of Patent Pools Demonstrates Variety of Purposes and Management Structures," *KEI Research Note 2007:6.*[5]

Notes for the Technology Transfer Practitioner

In recent years patent pools, whether standards-, innovation- or social benefit-based, have increased in popularity, and there is currently a wide range of pools/commons for the technology transfer professional to consider. They usually share the characteristics of being open, transparent, nonexclusive, regulated, fixed IP valuation, and they are managed by a third party. The array of options prompts the observation, "so many pools and so little time." Often, the pools are restricted to issued patents and, for many academic institutions, given the cost of patent prosecution, the majority of issued patents have already been licensed and may not be eligible for inclusion in the pool.

For standards-based pools, the test for eligibility for a given patent is strict and, for those patents that qualify, the patent pool may be the best source of finance return. For innovation-based pools, the benefit is primarily through the codification of a research-use exemption, and participation in the pool may well lead to commercial licensing resulting from increased research use of the patent. For social benefit pools, for-profit rights are normally retained and good public relations associated with making the institution's patent available for third world, environmental, or other social benefit applications, whether or not these are ever realized, is beneficial in and of itself.

IP Bundles

Intellectual property bundles are formed through the combination of complementary technologies to increase the value of the individual parts. For example, a bundle might include a pen from one party, ink for use in the pen from another party, and paper from a third party. Together the pen, ink, and paper can hold greater value than each of the parts on its own. Within the technology transfer profession, a number of universities are creating or

have attempted to create bundles involving their IP, which as separate pieces may have low commercial appeal on their own. There are several examples of groups creating IP bundles; some of which have had success, those that have not had success, and others who are still in the early stages of developing their IP bundling model. The following are examples of some efforts at creating IP bundles.

The InterAct Partnership (http://www.interactpartnership.co.uk) is a partnership between six leading government research organizations in the United Kingdom and is funded by the UK Department of Innovation. The group was formed, in part, to combine the IP of these institutions to create new commercialization opportunities. The institutions consist of the Centre for Environment, Fisheries and Aquaculture Science; the Defence Science and Technology Laboratory; the Food and Environment Research Agency; the Health Protection Agency; the Health and Safety Laboratory; and the Veterinary Laboratories Agency.

Each of these institutions has its own fields of expertise, but they also have several overlapping strengths. InterAct combines partner technologies from diverse areas to develop projects to address a variety of market needs and actively commercializes such projects to bring them to market. InterAct portrays itself as an example of how successful IP bundling across diverse organizations can add value both for the institutions and the commercial licensees. In its first three years, InterAct helped the member institutions identify more than seventy new project opportunities through seventeen facilitated workshops across overlapping areas. InterAct expects to bring complementary groups of IP assets to market through licensing, joint venturing, new company creation, and other routes. As of 2009, InterAct had catalyzed the formation of fifteen successful exploitation vehicles, which includes eleven licenses, three enhanced service offerings, and one spinout company.

The Inter-University Technology Bundling Project (IUTBP) (http://larta.org and http://www.larta.org/ClientsAndPrograms/Universities.aspx) is a joint program between Loma Linda University and the Larta Institute that has an overall goal to increase successfully transferred innovation coming from Larta's Network T2 (NT2) member institutions (some of the participating institutions include several of the University of California campuses,

California State University campuses, as well as the California Institute of Technology and Cedars-Sinai Medical Center) by overcoming competitive issues, creating virtual bundles of compatible IP from multiple NT2 sources, and facilitating the transfer of those bundles to the marketplace.

The IUTBP was built off of a pilot program from Larta, the Virtual Bundling Agent, which ran from 2005-2007. The IUTBP received a three-year grant in 2008 from the National Science Foundation (NSF) to create the infrastructure and system for identifying IP bundles and matching these bundles to companies for commercialization. At the time of this funding from the NSF, the IUTBP had forty-one IP bundles that had been identified from the work of the Virtual Bundling Agent and were ready for marketing to potential commercial licensees. The Virtual Bundling Agent developed confidentiality and noncompetition agreements between all of the NT2 institutions to overcome competitive issues, as well as convened expert panels to build industry-specific, complementary bundles from the IP of the NT2 institutions. Information about the bundles was then widely disseminated in broad and targeted ways for licensing purposes.

However, the process evolved from strictly licensing established IP bundles to soliciting specific needs from industry partners and then sharing these with the university partners. Industry partners are now asked to provide a statement of technology problems that need innovative solutions. The statement provided by the industry partners will help narrow and guide the university partners into identifying potential solutions from within their institutions. IUTBP collects these potential solutions, which may contain a bundle of IP available for licensing from any of the NT2 member institutions for review by the industry partner. Thus far no results have been reported on the success of this IP bundling project.

The Technology Research Collaborative (TRC) was created in 2003 under a memorandum of understanding between a variety of organizations in New Mexico. These included the University of New Mexico, New Mexico State University, New Mexico Institute of Mining and Technology, the MIND Institute, Sandia National Laboratory, Los Alamos National Laboratory, and the National Center for Genome Resources. The plan was to bundle patents and have licensing handled by one institution that would be agreed upon by the

other institutions. In 2005 the TRC members entered into an interinstitutional agreement to allow for the bundling of patents from the participating institutions.[6] However, nothing further became of the group's bundling efforts as the TRC shifted direction away from the bundling of precommercial IP.[7]

The Innovation Bundling Initiative, or IBI, was established in 2007 between Sandia National Laboratory, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Nevada Test Site.[8,9] The initiative was jointly developed by the Technology Ventures Corp. under a contract with the National Nuclear Security Administration to assist with the commercialization of technology. The institutions executed an IP bundling agreement that established the legal process for IP bundles to be out-licensed to commercial entities.

Under the initiative, patents originating from these facilities were to be put together into groups by subject matter and technology similarity. Under the IP bundling agreement, prospective licensees only needed to negotiate licenses for IP bundles with one licensing facility regardless of which of the institutions the IP came from. The IBI encouraged leveraging of Department of Energy R&D funds dedicated to complementary projects within the labs and the leveraging of the IP developed by the projects. The group was also focused on nonexclusive bundle licensing to improve the likelihood that the technologies would be successfully developed.

The IBI had more than 2,000 available patents entered into a common database that had been broken out into broad clusters such as nanotechnology, photovoltaics, and water remediation. The next step was to bundle the specific IP into single portfolios with overlapping technologies. The group's hope was that bundling their IP could make their technology more appealing and powerful as an IP portfolio. However, no results on the success of this initiative are known.

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True IP bundling exercises are aimed at identifying and combining complementary technologies (i.e. pen, ink, and paper) in a way that creates increased utility and value to the end user. This form of IP clustering stands to create the highest value return of various forms of clustering, but these bundles are the most challenging to identify even concep-

tually, leastwise to mine the IP assets of the various participants to identify bundling opportunities. In the therapeutic domain, this could entail identifying IP that covers composition of matter, method of production, and use claims. With software, it could be a combination of a modeling program, interface programs, and proprietary access to data. In other applications, identifying synergies between technologies is not as straight forward. Bundles may also involve different forms of intellectual assets including patents, software, research tools, data, or digital content. Compounding the complexity, IP bundles often require one-off custom interinstitutional agreements and do not benefit from the standardized approach taken with patent pools.

IP Portals

Technology or IP portals have been around for quite some time. These online Web sites collect and list IP that is available for licensing from single (such as a single university) or multiple (such as several universities) sources. In recent years some of these portals have been acquired and/or merged with other portals. Still others are recently coming into existence. Each has a slightly different focus, participating membership fees, ability to access and search technologies, and ability to receive automatic updates. Think of some of the larger IP portals as a shopping Web site such as Amazon.com that clusters products/technologies from multiple providers in one location. IP portals fall into two general types that university technology transfer offices might utilize to further commercialize their available IP, private and university portals.

Private IP Portals

Flintbox (http://www.flintbox.com) was created at The University of British Columbia and is now operated on a global basis by Wellspring Worldwide. Flintbox's goal is to serve as a global IP exchange providing easy and open access to innovation. It is the only innovation database in Canada offering online licensing, early-stage research results, and patents for license in one accessible platform. Institutional membership is free as is searching the available technologies or projects. Licensing can be conducted online with downloads and ecommerce enabled. Technology listings include a summary, patent information, description, areas of interest, what the posting party is seeking or offering, advantages, potential applications, state of development as well as any downloadable materials.

The iBridge Network (http://www.ibridgenetwork.org), a program of the not-for-profit Kauffman Innovation Network Inc., provides a centralized online source for research and innovations. The providers listing their technologies and other opportunities are predominantly universities. With membership, universities can search and post technologies as well as enhance their experience by receiving personalized emails on topics and innovations of interest. Technology information includes a title, posting institution, description, innovation details, and IP protection. There is also the option to enter into licenses directly from the Web site.

The UTEK Knowledge Express Free eMarket (http://www.knowledgeexpress.com) is a service designed to benefit the business development and technology transfer community. After registration on the Free eMarket, profiles and technologies can be submitted, which are then posted to all of Knowledge Express' services. Knowledge Express profiles and technologies can also be searched following the free registration. The Free eMarket requires no contracts, fees, or obligations. The technologies listed provide titles, inventors, abstract, applications, patent information, keywords, license information, and correspondence address including e-mail. Also, the dates the technologies were recorded and last updated are listed.

Others include:

- Folio Direct (http://www.foliodirect.net/)
- University-Technology.com (http://www.university-technology.com/index.php)
- yet2.com (http://www.yet2.com)

University IP Portals

Universities' own Web sites are a valuable resource when it comes to IP clustering within an IP portal. Some database systems used by university technology transfer offices to track their IP have features built in to help display available technologies online. Other universities have built their own custom systems to take the information from their databases and produce their own IP portals. However, these custom designed IP portals are not restricted to individual universities but can also be expanded to include groups of universities.

IP portal examples on a university's own Web site are demonstrated by the authors' current institutions. The University of British Columbia's University-Industry Liaison Office (UBC's UILO) has a Web link on its Web site entitled "Licensing Opportunities" (http://www.uilo.ubc.ca/licensing/opportunities.html). Technologies available for licensing have been clustered into diverse technology categories ranging from agriculture, aquaculture, and forestry to drug delivery to telecommunications and display to vaccines. Each available technology link opens a technology licensing opportunity page describing the available technology. Information included for each technology includes a title, value proposition, advantages, principal inventor(s), technology details, publications/references, patent status, development stage, reference number, contact information for the technology, and the date the information was last updated.

Oregon Health & Science University (OHSU)'s office of Technology Transfer and Business Development has a link on its Web site entitled "Available Technologies" (http://www.ohsu.edu/tech-transfer/portal/index.php). Similar to the available technologies from UBC's UILO, the available technologies from OHSU are broken down further into technology categories ranging from bioinformatics to databases to diagnostics to education and training to therapeutics. Each technology link opens a separate Web page listing the title, reference number, category information, inventors, value proposition, summary, market summary, patent status, inventor profile, publications, licensing opportunity, and contact information for the available technology. The technology information on the Web site is updated live when changes are made to OHSU's internal database. Furthermore, specific technologies are available for licensing online through either an academic license or a commercial license. License fees through the IP portal are handled by invoicing or through PayPal.

IP portals have been developed on regional scales as well. Two examples are the Massachusetts Technology Portal and Innovate Collaborate Oregon. The Massachusetts Technology Portal (http://www.masstechportal.org) is a joint project of the Massachusetts Association of Technology Transfer Offices and the Massachusetts Technology Transfer Center. This IP portal is designed as a unified search engine serving as a one-stop shop for technologies available for licensing from research institutions within the state of Massachusetts. Search criteria include the IP type, any word in the IP title, technology type, inventor, any word in the IP summary, and the organization.

Innovate Collaborate Oregon features innovations and opportunities from four of Oregon's research universities in a searchable IP portal (http://www.icoregon.net). Technologies available can be searched in several ways. First, a keyword search is available. Second, an advanced search is available that can search for a technology by keywords in the titles, in the descriptions, or by inventor name. A third method to search is by technology category. The search results can be sorted by title or date published to the IP portal.

Beyond regional efforts to cluster technologies from multiple institutions in an IP portal, another effort is to cluster IP from institutions participating in research consortiums. One example of this effort is the Clinical and Translational Science Awards (CTSA)-IP Web site (http://ctsaip.org). The CTSA program is a consortium of numerous medical research institutions across the United States and is funded by the National Center for Research Resources, part of the National Institutes of Health. There are currently fifteen institutions that have posted their available technologies on the CTSA-IP portal. The portal includes a text-searchable interface and regular, automatic updating with a standardized template to facilitate broad participation by CTSA consortium members.

Others include:
Pharma-links (http://www.pharmalinks.org/index.php)
NASA (http://technology.nasa.gov/)

Patent Auctions

In recent years several new companies have sprung up to conduct auctions involving IP, primarily involving patents. Online patent auctions have been around for several years. Such Web sites as ipAuctions.com (http://www.ipauctions.com) and patentauction.com (http://www.patentauction.com) can help companies and research institutions off-load their unused IP by clustering the IP into categories of related IP that can be searched by potential buyers. IpAuctions.com requires a listing fee and auction sale percentage to be paid by the seller. There are no fees for the buyer. Patentauction.com is completely free for the seller and the buyer. Beyond the online patent auction Web sites, several companies conduct live IP auctions as well. The first was Ocean Tomo, which held its first live IP auction in 2006 (http://www.oceantomo.com). The patents are clustered into lots based on the field of the IP. Ocean Tomo charges a fee for each piece of IP listed as well as a percentage of both the buyer's commission and seller's premium of the final bid price.

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Intellectual property portals exist at the level of the institution, the region, (inter)nationally, and by sector. In all cases, IP clustering occurs through a combination of classification systems and search engine that will allow a potential customer to readily identify IP of interest. Accordingly, IP portals serve as a passive marketing mechanism. Their benefits include the ability to profile an array of opportunities including expertise, patents (applied and issued), data, tools, biological materials, and content. Some portals will facilitate low-cost transactions through the use of click-wrap agreements, e-commerce, and downloads. The use of IP portals is not mutually exclusive, and a single institution could list its IP simultaneously on many different portals.

The experience on effectiveness of IP portals has been mixed with larger portals including many different institutions resulting in more transactions. This can often be traced to better placement through search engines like Google as well as a more effective marketing campaign. One important consideration in the use of any portal is to understand the internal resource requirements to keep information current. This is best addressed through automating the information flow from the office's internal information management system to the portal(s) in question.

Patents held by universities have been involved in IP auctions in the past, both online and live auctions. However, the greatest deterrent for U.S. universities to participate in such auctions has been the involvement of any U.S. government funding in the development of such IP. Under 37 CFR 401, the Bayh Dole Act, university and nonprofit organizations that have developed IP under funding contracts with the U.S. government may not assign the rights to such IP without the approval of the appropriate U.S. federal agency, except where such assignment is made to an organization that has as one of its primary functions the management of inventions, provided that such assignee will be subject to the same provisions under 37 CFR 401 as the U.S university or nonprofit. On occasion IP is developed at universities that do not involve funding from a U.S. government agency, but these are not the norm, so universities need to proceed with some caution in exploring whether or not to use the services of IP auctions.

IP Aggregation

Another form of IP clustering is the aggregation of related or similar IP. Intellectual property aggregation is similar to IP bundling, except that IP aggregation is the clustering of similar IP, not complementary IP as in IP bundling. For example, think of IP aggregation as a book of matches. A single piece of IP is a single match where as multiple pieces of similar IP is a book of matches. The book of matches has increased value versus a single match alone.

One group who has been embarking on IP aggregation is the West Coast Licensing Partnership (WCLP) (http://www.westcoastlicensing.com). Originally conceived in 2006 by Caroline Bruce from The University of British Columbia's University-Industry Liaison Office, the group has focused on improving the commercialization and access to proprietary technologies and research tools. Members of the WCLP, which are located up and down the West Coast of the U.S. and Canada, have collaboratively developed a joint portfolio of compatible technologies that can be combined or aggregated into a package for licensing purposes under a single nonexclusive license. This simplified licensing strategy significantly reduces commercialization barriers associated with high administrative overhead.

The WCLP is an unincorporated, largely self-financed association of research institutions operating under a governing memorandum of understanding that outlines the bundling/aggregation management procedures, the revenue sharing breakdown, and the rights to IP relating to technologies within the bundles. Interinstitutional agreements (IAs) are also entered into to govern the commercialization of each group of aggregated IP. In the IAs, it is important to negotiate the distribution of royalty revenues that would result from any licensing agreement in advance. IP has currently been aggregated into groups of mouse models and biomarkers. IP is aggregated in the following manner:

- *Information collection*: Technologies to be made available for nonexclusive licensing by the WCLP are identified by member institutions. Due to the fact that not all member institutions use the same internal database systems, the relevant information for these technologies is entered into an Excel worksheet circulated by and returned to the institution managing the partnership (host institution).
- *IP aggregation*: The WCLP host institution aggregates the technologies into broad compatible categories in consultation with the other participating member institutions.

- One institution assumes responsibility for overseeing each particular aggregated bundle (managing institution).

Once assembled, the managing institution is responsible for creating marketing materials and negotiating nonexclusive license agreements. The WCLP has also worked out arrangements with third parties to fulfill the transfer of any tangible assets covered by a license, such as the Jackson Laboratory in the case of mouse models. The success of the WCLP is still to be determined.

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The goal of IP aggregation is that by aggregating technologies from multiple parties and out-licensing under a single license agreement, the process will save time and money for both the participating parties and the licensees in the long run. IP aggregation is similar to IP bundling in some respects but it is also distinctly different in that it focuses on grouping similar/like technologies rather than complementary technologies as in IP bundling. One thing to consider with IP aggregation is the value to be placed on the aggregated group of technologies. Each individual piece of IP can be licensed as a stand-alone technology, but the idea of aggregating each piece with like technologies will hopefully add value to the overall group versus the individual tools and technologies.

One way to address this is to have each party assign a price to its technology and then set the total price for the aggregated bundle as the cumulative price. There may be other methods, but this has worked for members of the WCLP. Attention also needs to be paid in aggregating technologies that are truly similar; otherwise the aggregated group may become less attractive to potential licensees.

Considerations

No IP clustering method is perfect or free from issues that may arise. One of the greatest strains on a university technology transfer office is time and funding resources. How much time will be required by the technology transfer staff to undertake any one of these IP clustering methods? Clearly, some methods take much less time and effort than others. Also, certain IP clustering methods require funds that may not be available. In many cases

universities simply do not have the funds to undertake certain methods of IP clustering. Those that have had some success have received funding from internal and/or external sources, whether being from private foundations or the government. Therefore, each institution must determine which IP clustering methods are the right fit.

Conclusion

There are multiple methods for university technology transfer professionals to cluster their IP, either within their own university's portfolio or along with the portfolios of other institutions. As a large portion of university IP is never commercialized, IP clustering may be a way to increase the potential of some orphaned IP finding a commercial home.

Notes

1. Ed Levy, Emily Marden, Ben Warden, David Hartwell, Isaac Filate, "Patent Pools and Genomics: Navigating a Course to Open Science," *Boston University Journal of Science & Technology Law.* Vol 16. Winter 2010.
2. Jeanne Clark, Joe Piccolo, Brian Stanton, and Karin Tyson with assistance from Mary Critharis and Stephen Kunin, "Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?" United Sates Patent and Trademark Office, December 5, 2000.
3. "Antitrust Guidelines for the Licensing of Intellectual Property," issued by the US Department of Justice and the Federal Trade Commission, Section 5.5, April 6, 1995.
4. "Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition," issued by the US Department of Justice and the Federal Trade Commission, April 2007.
5. David Serafino. "Survey of Patent Pools Demonstrates Variety of Purposes and Management Structures." *KEI Research Note* 2007:6, June 4 2007.
6. http://www.sandia.gov/news-center/news-releases/2005/all/inter-inst.html.
7. Kevin Robinson-Avila, "New Mexico Wants to Jump-Start Economy with New Technology Push," *New Mexico Business Weekly,* April 24, 2009, Small Business Center, Policy Tracker.
8. Kevin Robinson-Avila, "Gather Together," *New Mexico Business Weekly,* August 24, 2007, Exclusive Reports.
9. Eric Billingsley, "The Bundling Boon," *Innovation: America's Journal of Technology Commercialization,* June/July 2007.