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**Intellectual Property as a Facilitator of Interactions in the Innovation Ecosystem**

*Plenary Session 2*

*"Innovation support services: what companies need from their parks and AOIs"*

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## **Intellectual Property as a Facilitator of Interactions in an Innovation Ecosystem**

### **Executive Summary**

The success of science and technology parks ("STPs") and areas of innovation ("AOIs") depends upon interactions among resident companies and various stakeholders in the innovation ecosystem. Intellectual property ("IP") rights are often overlooked as a means for stimulating such interactions. After identifying the relevant stakeholders, this paper proceeds with discussing the important role of IP rights in facilitating interactions in innovative ecosystems, in particular interactions with (1) sources of financing, (2) research institutions and business entities, and (3) the local community in the context of job creation. The paper proceeds with specific recommendations of services that STPs and AOIs can provide to enhance these interactions. Such services can be provided by IP manager specialists or, when budgets and levels of activity permit, more robust services could be provided by a full-service IP Centre.

### **I. IP Rights Facilitate Interactions Among Stakeholders**

First, it is important to identify the relevant stakeholders in an innovation ecosystem. In his recent article "Ecosystem stakeholder analysis: an innovation-driven enterprise's perspective", Jukka Majava observed that "[i]nnovation-driven enterprises (IDEs) must engage with various stakeholders to create new products and commercialise them". Majava identified "important stakeholders for supporting IDEs such as providers of different forms of capital, universities, and research institutes"<sup>28</sup>. Other stakeholders include the local community, particularly in the context of job creation as well as local, national and international business communities<sup>29</sup>.

As described below, IP rights have a positive effect in stimulating interactions between STP/AOI members with all relevant stakeholders.

#### **A. IP Rights Attract Financing**

Information asymmetry exists between innovative young companies and potential sources of financing because of the lack of a verifiable track record on the part of the innovative company. IP assets are a corrective to this imbalance and thus facilitate interactions which otherwise might not occur because of this asymmetry. Often most, if not all, of the value of such a company is in the form of non-tangible IP assets. Indeed,

intangible assets have gained importance as knowledge-intensive innovation activities have become the central drivers of competitive advantage in modern economies. They now count more toward a firm's market value than tangible assets (Lev and Daum 2004), and in such countries as Sweden, the United Kingdom, and the United States, investments in them have overtaken those in tangible assets (OECD 2013)<sup>30</sup>.

<sup>28</sup> J. Majava, "Ecosystem Stakeholder Analysis: An Innovation-Driven Enterprises Perspective", *Managing Innovation and Diversity in Knowledge Society Through Turbulent Time 25-27 May 2016*, Timisoara, Romania, p. 374.

<sup>29</sup> While the Jukka Majava article focused on so-called IDEs, the discussion of the relevant stakeholders is equally relevant to SMEs.

<sup>30</sup> Juan Mateos-Garcia, "Using Intellectual Property to Raise Finance for Innovation", available at [http://vubtechtransfer.be/medialibrary/Case\\_Study-IP\\_for\\_Financing.pdf](http://vubtechtransfer.be/medialibrary/Case_Study-IP_for_Financing.pdf), p. 1.

Without IP rights and effective mechanisms for their protection, little if any investment would be made in new or growing enterprises<sup>31</sup>. IP-rights “affect decisions on which businesses get investments, which products get launched, whether a business gets off the ground and other key decisions<sup>32</sup>”.

Numerous studies indicate positive correlations between patent filings and the actual or perceived value of a company, especially at an early stage. A report by the Organization for Economic Co-operation and Development (“OECD”) has noted that:

For small and medium-size enterprises (SMEs) that lack internal sources of financing and track records of success needed to attract external financiers, patents are increasingly seen as a tool to attract and secure financing. Ownership of a strong IP portfolio can signal to investors that a firm has a technological advantage over its competitors – one that it can protect via patent law. Furthermore, some banks are beginning to accept patents as collateral for bank loans and to develop IP-backed securities that patent holders can use to access financing<sup>33</sup>.

Even if at present just a few bank lenders accept IP as collateral or develop IP-backed securities, most banks “still take it into account in their lending decisions and would seek some control over it, making it part of the ‘security net’ for the loan”, as reported by the UK Intellectual Property Office in 2012<sup>34</sup>.

In addition, there is:

new evidence that patenting can positively affect investors’ perception of start-up quality across multiple stages of the entrepreneurial life cycle, as measured by the likelihood of receiving initial backing from a prominent venture capitalist, by unexpected increases in valuation estimates across rounds of financing, and by the probability of successful exit through an initial public offering<sup>35</sup>.

Graham and Sickelman believe that IP rights make it easier for funding sources to reach a positive conclusion about a company in the face of a limited amount of time to conduct due diligence. They also note that patents “might signal to investors that the company has the ‘discipline and technical expertise’ to ‘codify tacit knowledge’ which could be viewed as a ‘brain drain’ of the company’s valuable know-how if key engineers were to leave”<sup>36</sup>.

Several recent studies also have shown that IP assets can cause venture capital (“VC”) financing to come sooner and in larger amounts. For example, Honen et al. found that for US-based biotechnology companies, pending patent applications (which have not yet been granted as issued patents) increase the amount of funding by around USD 630.000<sup>37</sup>.

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<sup>31</sup> Mario Cardullo, “Intellectual Property - The Basis for Venture Capital Investments”, p. 2.

<sup>32</sup> Mark Schultz & Kevin Madigan, “The Long Wait for Innovation: The Global Patent Pendency Problem”, Center for the Protection of Intellectual Property, 2016, p. 2.

<sup>33</sup> OECD, “Intellectual Property as an Economic Asset: Key Issues in Valuation and Exploitation, Background and Issues”, Paris, 2005, p. 462.

<sup>34</sup> Juan Mateos-Garcia, *cit.*, p. 3.

<sup>35</sup> Hsu D. H. and R.H. Ziedonis, “Patents as quality signals for entrepreneurial ventures”, *Academy of Management Best Paper Proceedings*, 2006. This article reported the results of a study conducted on nearly 400 U.S. venture capital-backed semi-conductor start-ups established between 1975 and 1999.

<sup>36</sup> Stuart J.H. Graham and Ted Sichelman, “Why Do Start Ups Patent”, *Berkeley Technology Law Journal*, Vol. 23:3, p. 1078-9.

<sup>37</sup> IP-Based Financing of Innovative Firms, *Enquiries into Intellectual Property’s Economic Impact*, 2015, p. 462.

Notwithstanding these significant potential investment benefits, IP rights remain underutilised by many SMEs. Even when IP rights are obtained, studies suggest that often it is in response to specific needs and are not part of an overall strategic plan. Indeed, "the low participation of SMEs in IP-based finance may partly be due to SME's management of their intellectual assets" and because "SMEs still fail to understand the potential of IP for financing purposes"<sup>38</sup>.

#### B. IP Rights Facilitate Interaction Among the Business and Research Community

Patent systems around the world are all based on the following premise: the government grants a limited monopoly to innovators and in exchange innovators are required to disclose their inventions to the public. After expiration of the limited monopoly, the technology moves into the public domain where it is available to everyone. In this way, patent systems around the world function as knowledge-sharing vehicles.

Forbes online notes that while some people continue to maintain that IP rights hinder knowledge-sharing, in reality "patents improve the allocation of resources by encouraging rapid experimentation and efficient *ex-post facto* transfer of knowledge across firms"<sup>39</sup>. A 2006 study by Francois Leveque and Yann Meniere support this theory noting that a very large majority of "US, European and Japanese businesses said they actually rely upon information disclosed in patents to keep up with technology advances and direct their own R&D efforts"<sup>40</sup>.

IP rights also stimulate interactions by eliminating obstacles in the flow of information exchange between IP right holders and potentially interested stakeholders, namely investors and potential business partners. By allowing the disclosure of (already) protected information, the ownership of IP rights gives the holder the freedom to share information and therefore take advantage of potential opportunities for collaboration and funding. Sharing of information can take place after an application for an IP right is filed. This is often well before the IP right is granted. Otherwise, confidentiality agreements are necessary each time IP-related information is shared with a new party.

Indeed, Graham and Sickelman refer to patents as a "non-negotiable form of non-disclosure agreement (NDA) with broad injunctive relief"<sup>41</sup>. If the party receiving information breaches an NDA it is usually much more difficult to prove such breach compared to demonstrating infringement of a patent or other IP right. Beyond the sharing of information, IP rights facilitate the interaction of STP members with business entities through potential joint development projects, in-licensing, out-licensing and cross-licensing of IP rights.

Start-up companies are not always in a position to take a concept from its initial phase, all the way through to commercialisation. In such cases it can be mutually beneficial to enter into joint

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available at <http://www.oecd.org/sti/ieconomy/Chapter9-KBC2-IP.pdf>

<sup>38</sup> Ibid, p. 465.

<sup>39</sup> Marshall Phelps, "Do Patents Really Promote Innovation? A Response To The Economist", Forbes Online,

[https://www.forbes.com/sites/marshallphelps/2015/09/16/do-patents-really-promote-innovation-a-response-to-the-](https://www.forbes.com/sites/marshallphelps/2015/09/16/do-patents-really-promote-innovation-a-response-to-the-economist/#139746891921)

[economist/#139746891921](https://www.forbes.com/sites/marshallphelps/2015/09/16/do-patents-really-promote-innovation-a-response-to-the-economist/#139746891921).

<sup>40</sup> Leveque, Francois and Ménière, Yann, "Patents and Innovation: Friends or Foes?", 2006, available at SSRN: <https://ssrn.com/abstract=958830> or <http://dx.doi.org/10.2139/ssrn.958830>.

<sup>41</sup> Graham & Sichelman, *cit.*, p. 1082.

development arrangements with another entity in order to continue the development of innovative products and services. Without IP rights such projects would be much more difficult. IP licensing experts recognize the benefits of joint development agreements noting that such agreements:

allow the company to create a better product more expeditiously than building the required technical capability in-house. As long as the company obtains adequate ownership and/or licensing rights to use and commercialize the developed IP in its business, the company may be no worse off than if it had developed and owned all the IP itself<sup>42</sup>.

IP rights also facilitate interaction with companies interested in more traditional licensing arrangements in order to create important revenue streams. In the United States alone \$ 115.2 billion was generated in 2012 from the licensing of IP rights<sup>43</sup>. Much of that income went back into innovative activity, generating what could be called a “virtuous circle”.

C. IP Rights Facilitate Interaction with the Local Community by Creating More and Higher Paying Jobs

IP rights facilitate the interaction of STP/AOI members with the local community since such rights are very often associated with business growth and employment. Recent data from both Europe and the United States is illustrative.

With respect to Europe, an October 2016 joint report from the EPO and EU Intellectual Property Office found that IP-intensive industries generated 27.8% of all jobs in the EU during the period of 2011-2013<sup>44</sup>. In addition to these jobs another 22 million jobs were associated with companies that provide products and services to the IP-intensive entities. The total direct and indirect employment associated with IP-intensive industries in the EU is now over 80 million. Over this same period such industries generated more than 42% of the total economic activity (GDP) in the EU, worth €5.7 trillion. IP-intensive industries also pay higher wages than other industries with a wage premium of 46% over other industries<sup>45</sup>.

The relationship between IP rights and job creation in Europe is further evidenced by the 2013 report by the European Commission which commented on an earlier survey of European STPs conducted by IASP’s European Division. In this survey senior STP management were asked to rank the top 5 contributions (from a list of 9 options) that their park made to the local economy. The clear first choice was high quality employment creation<sup>46</sup>. This data shows that STPs and AOIs are particularly well-suited to use intellectual property as a driver of local, high-quality employment.

Recent data in the United States is remarkably similar to that of Europe. In 2016, “the Department of Commerce reported that IP-intensive industries support over 45 million U.S. jobs—30% of the nation’s

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<sup>42</sup> T. Maddy, *The Shifting Subject Matter of IP Licensing in the Information Age: Maximizing the Licensor’s Asset Monetization while Facilitating the Licensee’s Success*, available at <https://www.hunton.com/images/content/3/2/v2/3273/The-Shifting-Subject-Matter-of-IP-Licensing-in-the-Information-A.pdf>

<sup>43</sup> *Intellectual Property and the U.S. Economy: 2016 Update*, Joint Project Team with Economics & Statistics Administration and the U.S. Patent and Trademark Office, p. 26.

<sup>44</sup> *Intellectual property rights intensive industries and economic performance in the European Union, Industry-Level Analysis Report*, October 2016 2<sup>nd</sup> edition, p. 3. In the context of the OECD report, IP-intensive refers to all forms of IP rights, including patents, trademarks, designs, copyright and geographical indications.

<sup>45</sup> *Ibid.*

<sup>46</sup> European Commission, “Setting up, managing and evaluating EU science and technology parks”, 2013, p. 19.

total—and contribute more than \$6 trillion—or 38.2%—of the United States’ GDP. The biopharmaceutical industry alone employed almost 854,000 Americans in 2014<sup>47</sup>. Patent-intensive industries are responsible for a disproportionately high percentage of indirect employment compared to companies holding other forms of IP rights<sup>48</sup>.

Those employed in IP-intensive industries in the United States continue to earn significantly more than those in non-IP-intensive industries. In 2014, workers in IP-intensive industries earned an average weekly wage which was 46 percent higher than the weekly wages in non-IP-intensive industries in the private sector. This wage premium has increased over time from 22 percent in 1990 to 42 percent in 2010 and 46 percent in 2014. Patent- and copyright-intensive industries have seen particularly fast wage growth in recent years, with the wage premium reaching 74 percent and 90 percent, respectively, in 2014<sup>49</sup>.

Paul R. Michel, writing as an op-ed contributor in the New York Times in 2010 reported that his analysis of the data reported in the 2008 Berkeley Patent Survey suggests that each issued US patent is associated with 3 to 10 new jobs<sup>50</sup>.

This data from both Europe and the U.S. show the importance of IP rights to both direct and indirect job creation.

## II. What Services Can STPs and AOIs Offer to Enhance Interactions Among Stakeholders?

In light of the above, what services should AOIs and STPs offer to their residents/users to enhance these interactions? This first part of this section discusses the potential roles of IP Managers. The paper will conclude with a brief description of a full-service IP Center within an STP or AOI.

In order to benefit fully from the interactions described above, IP right protection must be sought at an early stage. It is therefore important that STPs and AOIs should be capable of providing IP services to their members in order to give them the means to interact effectively with various stakeholders during all of the different growth phases of a company.

### A. IP Managers

The IASP April 2016 Question of the month asked about the levels of assistance or consultancy provided by management teams of STPs and AOIs with respect to intellectual property issues of resident companies. The final results are shown below:

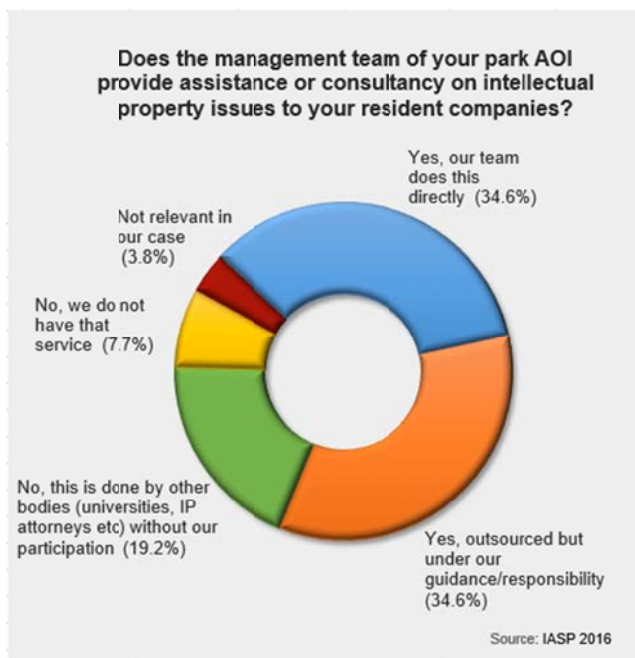
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<sup>47</sup> Dough Schoen, *The Unsung Job Creator: Intellectual Property*, available at <https://www.forbes.com/sites/dougschoen/2016/12/01/the-unsung-job-creator-intellectual-property/#6fe0fd27118f>

<sup>48</sup> *Intellectual Property and the U.S. Economy: 2016 Update*, Joint Project Team with Economics & Statistics Administration and the U.S. Patent and Trademark Office, p. 14, available at <http://www.esa.doc.gov/sites/default/files/ip-and-the-us-economy-september-2016.pdf>

<sup>49</sup> *Ibid.*, p. ii.

<sup>50</sup> Paul R. Michel and Henry R. Nothhaft, “Inventing Our Way Out of Joblessness”, available at <http://www.nytimes.com/2010/08/06/opinion/06nothhaft.html>. Paul Michel is a former chief judge of the United States Court of Appeals for the Federal Circuit, which is a specialised court for patent appeals.



Based on these survey results, many STPs and AOIs already recognize the importance of IP rights.

Given the importance of IP rights as key facilitators of interactions in the innovative ecosystem, the authors recommend that STPs and AOIs include in their organizations one or more IP manager specialists to create a "one-stop shop" for developing appropriate IP strategies for their members. With their specialized backgrounds and training, IP managers can add significant value by providing a unitary vision of the role of IP throughout the life-cycle of a company.

Innovative companies have a variety of IP needs in different stages of their growth and different types of professionals are required to meet those needs (e.g., patent search firms, patent agents, IP attorneys, licensing specialists, etc.). In-house IP managers can coordinate all of these activities while maintaining the unitary vision of the company.

IP managers should be involved at the very beginning of any innovative activity to prevent common mistakes which can result in lost opportunities for protecting worthy inventions. This may require, for example, the involvement and supervision by the IP manager of legal consultants (e.g., for drafting R&D and/or confidentiality agreements). When the research activity achieves sufficient results, the IP manager can assist the company in identifying and obtaining the most appropriate types of IP rights and can select appropriate IP professionals to assist with this activity. IP managers can help the company develop a global IP strategy to match its international business plans which also requires coordinating with IP specialists around the world.

In addition, IP managers can assist STP and AOI members in using IP rights to improve their bargaining power with respect to potential investors and business partners. Finally, IP managers can assist in negotiations with such parties. These negotiations may involve outside IP lawyers, often located in several jurisdictions.

The job qualifications and description of an IP manager in an STP could be analogized to that of an intellectual property manager of a university technology transfer office. Thus, representative qualifications may include, for example, licensing experience or licensing certification and a master's degree in business, science or engineering. Specific duties and responsibilities may include the following:

- identifying technology with commercial applications
- negotiating and executing license and other types of agreements
- providing information to outside IP attorneys to assist with securing IP rights
- negotiating with lenders for loans using IP-rights as collateral or otherwise
- complying with government regulations concerning technology transfer agreements
- developing appropriate commercialization strategies
- performing market analysis and providing marketing support
- developing and coordinating workshops on intellectual property and commercialization

#### B. Full-Service IP Centres

When budgets permit, STPs and AOIs also should consider establishing a full-service IP Centre which include other professionals in addition to IP managers, such as IP consultants who otherwise would need to be hired as outside service providers. In this way, STPs and AOIs can manage directly the IP needs of their members in the jurisdictions in which they are located. They also can coordinate the activities of IP professionals in other jurisdictions. A good example of this full-service approach is IP Centre Skolkovo in Moscow.

#### **Conclusion**

This article has addressed the importance of IP rights in stimulating interactions among various stakeholders in the innovation ecosystem, in particular with respect to (1) financing, (2) the local and international business community, and (3) job creation. Because of the importance of IP rights in stimulating interactions among these stakeholders, the authors recommend that STPs and AOIs provide specific services which may be performed by one or more IP managers. On the other end of the spectrum, when budgets and levels of activity permit, an STP or AOI may consider establishing a full-service IP Centre, which can manage all IP-related activities for its members.