IASP International Association of Science Parks and Areas of Innovation

35th IASP World Conference
on Science Parks and Areas of Innovation 2018
Isfahan, Iran

The Role of Intellectual Property in Enhancing Entrepreneurship for Growth and Sustainability in STPs and AOIs

Parallel session 4:

Entrepreneurship for growth and sustainability

Authors:

Mariella Massaro
Robert Alderson

Hosted by:

ISFAHAN
SCIENCE & TECHNOLOGY TOWN
(ISTT)

ISBN: 978-84-09-17612-0

The Role of Intellectual Property in Enhancing Entrepreneurship for Growth and Sustainability in STPs and AOIs

by Mariella Massaro and Robert Alderson of Jacobacci & Partners S.p.A., Turin, Italy

Executive Summary

The overall theme for the 2018 IASP World Conference hosted by Isfahan Science and Technology Town is "Towards sustainable cities and communities: Fostering innovation ecosystems." The description for the session to which this paper is directed refers specifically to six of the seventeen Sustainable Development Goals ("SDGs") adopted by the United Nations in 2015. Those six SDGs are as follows: SDG2 (Zero hunger), SDG3 (Good health and well being), SDG6 (Clean water and sanitation), SDG7 (Affordable and clean energy), SDG8 (Decent work and economic growth) and SDG13 (Climate action). This paper describes (1) the contribution of intellectual property to the achievement of SDGs, (2) programs and services to be implemented in Science and Technology Parks ("STPs") and Areas of Innovation ("AOIs") to support these efforts and (3) the role of IP and Innovation professionals with appropriate backgrounds in achieving desired results.

Intellectual Property Rights Facilitate Achievement of SDGs

Following the United Nation's adoption of all 17 SDGs, the World Intellectual Property Organisation ("WIPO") has met regularly to discuss how it can support Member States in the attainment of these goals.

Several representatives of WIPO Member States, including Iran, Indonesia, Nigeria, Brazil and Chile, have noted that the 17 SDG goals are "holistic" in nature and "indivisible". These Member States, therefore, recommended that WIPO consider all 17 SDGs as a whole, in particular during upcoming sessions of WIPO's Committee on Development and Intellectual Property ("CDIP").[1]

Other WIPO Member States, namely WIPO Group B (consisting of so-called developed countries) requested WIPO to target the most relevant SDGs related to WIPO's work. In this regard, the CDIP has noted that "technology, innovation and creativity are key elements which cut across and can contribute to the achievement of many of the SDGs".[2]

In his presentation annexed to the CDIP report of May 15-19, 2017, Francis Gurry, Director General of WIPO, maintains that innovation in practice contributes directly to the achievement of certain SDGs, notably SDG 2, SDG 3, SDG 6, SDG7, SDG 8, SDG 11, and SDG 13, while innovation as a policy setting can assist in realising other SDGs, namely SDG 1, SDG 8, SDG14 and SDG 15.[3]

Thus, WIPO's position is that all six of the SDGs identified in the description for this session can be directly achieved through innovation. In addition, SDG 11 (for which innovation also contributes directly) relates to the overall theme of the 2018 World Congress, Sustainable Cities and Communities.

While emphasizing the key role of innovation in the achievement of SDGs, WIPO also highlights the important linkage between innovation and intellectual property rights ("IPRs") and notes that its programs are useful in several specific ways, including:

1. Establishing a legal framework for intellectual property as an essential component of the innovation ecosystem, for example, through various IP-related treaties.

2. Cost-effectiveness, transactional efficiency and simplicity in the operation of intellectual property systems internationally, for example, through treaties, global IP systems, platforms and databases.

---

[1] Catherine Saez, "WIPO And The SDGs: Differing Views At Committee On IP And Development", Intellectual Property Watch, September 2017.
[2] Ibid.
[3] Francis Gurry, "WIPO and the Sustainable Development Goals (SDGs)", Annex to WIPO Committee on Development and Intellectual Property, May 2017.

3. Enhancing capacity across innovation ecosystems, for example, through global IP systems, platforms and technical infrastructure and partnerships.

4. Economic intelligence, for example, through databases, and economic and statistical reports.[4]

Taken together, these 4 points demonstrate that WIPO services related to innovation and intellectual property encourage efficient transmission of information which increases predictability and reduces uncertainty.

SDG 8 and SDG 3 are discussed below as representative examples of how IPRs can facilitate the direct achievement of the targets of certain SDGs while encouraging entrepreneurship and how IPRs can enhance links between STPs and AOIs with the local and international community.

In this respect, IPRs are indeed a crucial component for efficient knowledge-sharing. As noted by Daisry Mathias, State House Advisor on Youth Matters in Namibia, without an effective intellectual property system many "aspiring entrepreneurs were reluctant to come forward to share their ideas with development agencies or consultants, for fear of losing them due to the absence of an IP policy." She continues by noting the effect of Namibia's new IP policy which "encourages a culture of entrepreneurship among the youth".[5]

SDG 8 – Decent Work and Economic Growth

Numerous studies have demonstrated the connection between technology-oriented SMEs, particularly IPR-intensive industries, and increased employment opportunities in high-paying jobs as well as the contribution of such companies to the overall gross domestic product ("GDP").[6] As discussed below, such increased employment opportunities encourages entrepreneurship and enhances the connection between STPs and the cities in which they are located.

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[7]. In addition to these jobs another 22 million jobs were associated with companies that provide products and services to IP-intensive entities - so-called indirect employment. 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[8].

[4] Ibid.
[5] Eric Mhunduru, "Intellectual property law to encourage entrepreneurship", Windhoek Observer, May 2016.
[6] Much of the information related to SDG 8 discussed herein was included in a paper submitted by the same authors for the 34th IASP World Conference on Science Parks held in Istanbul, Turkey in 2017 which is entitled "Intellectual Property as a Facilitator of Interactions in an Innovation Ecosystem". That paper, which was accepted for one of the plenary sessions, addresses the role of intellectual property (1) in attracting financing, (2) in facilitating interactions among the business and research communities, and (3) in facilitating interaction with the local community by creating more and higher paying jobs. The 3rd main point of that paper is equally applicable in the context of this year's paper both in enhancing the ever-growing connection and collaboration between STPs and cities and in achieving the targets of SDG 8.
[7] Intellectual property rights-intensive industries and economic performance in the European Union, Industry-Level Analysis Report, October 2016 2nd 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.
[8] Ibid.

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[9]. This data shows that STPs and AOIs are particularly well-suited to use intellectual property as a driver of local, high-quality employment which enhances the connections between STPs and cities.

Recent data from 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 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"[10]. Patent-intensive industries in the US are responsible for a disproportionately high percentage of indirect employment compared to companies holding other forms of IPRs[11].

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[12].

A recent report by the Global Innovation Policy Center ("GIPC") confirms the linkage between innovation, intellectual property, and high-quality employment. The GIPC Report demonstrates the strong correlation between intellectual property and the creation of knowledge-based economies. More specifically, it reports direct correlations between (1) IP and innovation and (2) IP and R&D. With respect to the second point, the stronger the IP environment, the higher the number of researchers in R&D.[13]

Thus, there is clear support for the proposition that through high-quality job creation, intellectual property and the innovation it protects, encourages entrepreneurship and strengthens the connections between STPs and the cities in which they are located.

SDG 3 – Good Health and Well-Being

With respect to SDG 3 (good health and well-being), representatives from WIPO, the World Health Organization ("WHO") and the World Trade Organization ("WTO") recently held a technical symposium in connection with the WHO, WIPO, WTO Trilateral Cooperation on Public Health, Intellectual Property and Trade to consider, among other things, how to balance the interests of patent holders and the needs of people in low and middle income countries who need access to innovative medical treatments.[14]

---

[9] European Commission, "Setting up, managing and evaluating EU science and technology parks", 2013, p. 19.

[10] 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

[11] 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

[12] Ibid., p. ii.

[13] U.S. Chamber International IP Index, 6th Edition, Global Innovation Policy Center, February 2018, pp. 27-28.

[14] WHO-WIPO-WTO Technical Symposium on Sustainable Development Goals: Innovative technologies to promote healthy lives and well-being http://www.who.int/dg/speeches/2018/technical-symposium-sdgs/en/

Each of the Directors General of the three organisations mentioned in their opening comments that "they intended to expand the partnership in the coming years, with the shared goal of boosting innovation to improve health outcomes in countries around the world."[15] All the comments included some reference to the role and relevance of intellectual property in pursuing these shared goals.

Francis Gurry (the WIPO Director General) noted that health security depends on continued innovation of new technologies since "health, innovation and trade are inextricably interlinked".[16] In analyzing the increasing complexity and costs associated with health systems, Mr. Gurry pointed out that recently non-state actors have become more involved in a field historically governed by two main sources: "the public purse and the market system", including WIPO itself.[17]

In this respect WIPO has initiated an important program called WIPO Re:Search, addressing, *inter alia*, neglected tropical diseases ("NTDs") which involves "harnessing intellectual property in the fight against NTDs" along with "knowledge transfer and capacity buildings[18]". WIPO notes that the program's combination of IP, resources and know-how "accelerates research into NTDs, malaria and tuberculosis, increasing the chances of success and reducing costs".[19]

The WTO Director General Roberto Azevêdo noted in particular the "increasingly significant R&D activity" conducted by start-ups and the need to support such innovative R&D activities and related IP bearing in mind the ultimate public interest in the effective availability of their innovative technologies".[20]

The WHO Director General mentioned supporting innovative approaches such as creating the Medicines Patent Pool "to increase access and promote innovation in the fields of HIV, hepatitis C and tubeculosis through voluntary licensing and patent pooling."[21] In this context it is noteworthy that the most recent available information indicates that around 95% of drugs on the Model List of Essential Medicines ("MLEM") are off-patent. In other words, those MLEM were once patented but those patents have expired allowing generic competition to enter the market.[22]

The WTO Director General further commented on the need for "a balanced IP regime that recognizes the entitlement of countries to make full use of available policy options and flexibility under the TRIPS Agreement". This includes allowing least developed countries to have "maximum possible flexibility" with respect to pharmaceuticals until at least 2033.

Thus, it should be clear that IPRs should not be thought of as barriers to access to health care products *per se*. Indeed, IPRs act as facilitators of innovation that can result in new products and services for

[15] WIPO, WHO and WTO Directors General Pledge Further Cooperation on Innovation and Public Health, World Intellectual Property Organization, February 2018.
[16] Symposium highlights role of innovative technologies in advancing SDGs, World Trade Organization, Intellectual Property: Formal Meeting, February 2018.
[17] Ibid.
[18] Sharing Innovation in the Fight Against Neglected Tropical Diseases, WIPO Partnership Hub Administrator: Bio Ventures for Global Health, August 2014.
[19] Ibid.
[20] Id.
[21] Id.
[22] Patent protection provides a limited monopoly to the inventor in exchange for disclosing the details of an invention to the public. After the patent expires, the invention falls into the public domain such that it can be freely used by anyone. Without the financial incentives provided by the limited monopoly, it is unlikely that pharmaceutical companies would invest in extremely costly R&D to develop new drug products which includes the time-consuming and costly regulatory approval process. The limited monopoly provided by a patent can be no greater than 20 years from the filing date of the patent application unless extensions are provided to account for regulatory delay in issuing marketing approval for a pharmaceutical product. In contrast, copyright protection lasts much longer and trademark and trade secret protection can have an unlimited duration.

all. Indeed, as noted by Margaret Kyle, Professor of Economics from the Center for Industrial Economics (CERNA) in France, there are many other significant barriers to access including "regulatory, health insurance and price control mechanisms.[23]

In addition, the GIPC Report referenced above in connection with SDG8 further notes that economies with a strong IP environment are associated with higher rates of clinical research growth.[24] This can serve to attract R&D-related employment from the local community, further strengthening the links between STPs and cities. Indeed, the GIPC Report notes correlations between strong intellectual property systems and R&D expenditure, access to venture capital, foreign direct investment, growth of high-tech sectors, innovation and creative output and an overall stronger business environment. As noted in the report, all of the above contributes to the creation of knowledge-based economies.[25]

Recommended Programs and Services for STPs and AOIs

Since innovation and intellectual property contribute directly essential to the success of all 6 SDGs listed for this session, it follows that management of STPs and AOIs, which are known for being "powerful tools for economic growth and for consolidation of the knowledge economy at the regional and city level"[26], should consider providing certain services and programs to assist their residents, keeping in mind that specific needs can vary depending on the type of company and its stage of development.

In general terms, the authors suggest giving consideration to the benefits provided by organizing STPs or AOIs in specialized technology clusters whenever possible.

Technology Clusters

The use of technology clusters allows for more efficient cross-fertilization of ideas as each cluster faces somewhat different challenges and opportunities. An example of an STP that uses specialised clusters is Hong Kong Science and Technology Parks ("HKSTP") which groups its residents into (1) biomedical, (2) electronics, (3) green technology, (4) information and communications technology (ICT) and (5) material and precision engineering.[27]

HKSTP notes that their strategy of using clusters encourages team work and "has built a cohesive and powerful base from which to work with the goal of transforming the Hong Kong region into a new epicenter of tech innovation". HKSTP further notes that this strategy allows their residents to "pool resources, ideas and expertise and to do so much more with less".[28]

Skolkovo is another example of a science park that organizes its residents in specialized clusters, namely (1) biomedical, (2) space technology and telecommunications, (3) energy efficient technologies, (4) information technology and (5) nuclear technology.[29]

The intermixture of large companies and SMEs, including start-ups, within the same cluster creates opportunities for collaborative projects. If a large company is interested in the technology of a start up in the same cluster, a joint development project opportunity could emerge where the large company can offer its R&D resources to the start-up. Indeed, cluster arrangements create many possibilities for Open Innovation-style cooperation.

---

[23] Symposium highlights role of innovative technologies in advancing SDGs, World Trade Organization, Intellectual Property: Formal Meeting, February 2018.
[24] U.S. Chamber International IP Index, 6th Edition, Global Innovation Policy Center, February 2018, p. 28.
[25] Ibid.
[26] Luis Sanz, "Science Parks and Areas of Innovation", Workshop on the role of STPs and Incubators in innovation eco systems, Thessaloniki 23-24 May 2017.
[27] Retrieved from: www.hkstp.org/en/services/our-focus/technology-clusters/
[28] Ibid.
[29] Retrieved from: sk.ru/foundation/about/p/clusters.aspx

The combination of a cluster / specialized model and the open innovation culture has been proved to be effective. Indeed, as noted by Ystrom and Aspenberg, "while it could be argued that globalization would diminish the importance of a company's location, research has shown that in an increasingly complex, knowledge-based and dynamic economy, regional collaboration has in fact become a critical aspect of enhancing competitiveness, locally as well as globally. Still, in order to create sustainable, innovative and successful clusters, interaction and collaboration among its members is necessary, which is not always easy to accomplish and requires actions that stimulate bottom-up activity rather than top-down directives"[30].

Technology clusters also can facilitate the organization of cluster-based events which are relevant for particular technology sectors. For example, venture capital ("VC") companies themselves often include professionals and/or groups which invest only in certain technology areas. Cluster-based events thus can match specialized VC entities with a corresponding STP cluster, for example, information and communications technology.

Other events may include cluster-based educational seminars on issues such as intellectual property. This approach can be particularly useful where intellectual property laws treat certain types of technology differently. For example, the standards and limitations for patent protection for computer-implemented inventions is somewhat different from those of biotechnology. Indeed, the standards can be different within the same patent office (e.g., the European Patent Office) and are certainly different when comparing patent offices around the world. In any event, because intellectual property attracts venture capital and other types of funding, it is important that residents of STPs and AOIs have at least a basic understanding of intellectual property law for their particular technology in order to improve their ability to obtain financing.

Of course, such events also can include all of the residents of STPs and AOIs along with the public at large. A good example of this is the annual Skolkovo Patent School which is open to all Skolkovo resident companies and which is attended by intellectual property professionals from around the world.[31]

The Role of IP and Innovation Managers in Supporting Innovative Companies in STPs and AOIs

In order to take full advantage of the benefits of IP protection for innovation created in STPs and AOIs such protection must be sought at an early stage. It is therefore important that STPs and AOIs should be capable of providing specific IP services to their members in order to give them the means to interact effectively with various stakeholders during the different growth phases of start-up companies.[32]

The stage of a company's development is important since services and programs will be different over a company's life-cycle. Jukka Majava of the University of Oulu, Finland, describes a specific growth cycle for innovation-oriented companies. In his article "Ecosystem Stakeholder Analysis: An Innovation-Driven Enterprises Perspective", Dr. Majava identifies the following stages which are somewhat different from the classical 5-stage growth of other types of companies:[33]

---

[30] Anna Ystrom and Hedvig Aspenberg, "Open for Innovation? Practices supporting collaboration in Swedish regional clusters", 2017.

[31] Retrieved from: sk.ru/foundation/events/september2017/patent_school

[32] Much of the information related to the description of IP and Innovation managers was included in a paper submitted by the same authors for the 34th IASP World Conference on Science Parks held in Istanbul, Turkey in 2017. The importance of IP and Innovation managers is equally (if not more) relevant in the context of enhancing entrepreneurship for growth and sustainability.

[33] J. Majava, "Ecosystem Stakeholder Analysis: An Innovation-Driven Enterprises Perspective", Managing Innovation and Diversity in Knowledge Society Through turbulent Time, May 2016, Timisoara, Romania, p. 374.

1. For innovation-oriented companies, Dr. Majava notes that the cycle starts with a technology-based idea, which often originates from government-funded basic research at a university or a research institute. He notes that at this stage, intellectual property protection is important in order to support commercialisation of the invention.

2. Once IP protection has been sought, the invention can be licensed to an existing company or a new start-up. Accelerators and incubators may be involved in this start-up phase, and seed funding may be obtained, for example, through angel investors.

3. If the company is successful, more funding can be acquired, typically from venture capital sources and new employees can be recruited. Venture capital funding is heavily dependent on having exclusive rights in the form of intellectual property.

4. If the company is successful, an initial public offering, merger, or acquisition by another company may take place.

As noted above, intellectual property should be obtained at an early stage since it is important in allowing development of the subsequent stages of an innovative company. The growth and sustainability of residents of STPs and AOIs through appropriate use of intellectual property leads, of course, to the growth and sustainability of STPs and AOIs themselves which, *ipso facto*, contributes to growth and sustainability of the local economy.

Because of the critical role of IPRs, STPs and AOIs should include in their organizations one or more IP and Innovation manager to create a "one-stop shop" for developing appropriate IP and innovation strategies for their members. The presence of IP and Innovation managers adds significant value by providing a unitary vision of the role of IP and innovation throughout the life cycle of a company. Innovative companies have a variety of 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.). Therefore, IP and Innovation managers are needed to coordinate all of these activities while maintaining the unitary vision.

IP and Innovation managers should be involved at the very beginning of any innovative activity in order to avoid common mistakes that 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, an IP and Innovation manager can assist the company in identifying and obtaining the most appropriate types of IP rights and can select appropriate intellectual property professionals to assist in this activity. IP and Innovation 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 and Innovation managers can assist STP and AOI members in using their IP rights to improve their bargaining power with respect to potential investors and business partners. Finally, IP and Innovation managers can assist in negotiations with such parties. These negotiations may involve outside IP lawyers, often located in several jurisdictions.

Conclusion

The authors first addressed how intellectual property rights contribute either directly or indirectly to the achievement of all 17 United Nations SDGs. Recent WIPO publications note that IPRs contribute directly to all of the SDGs associated with this session. WIPO reports also describe the important link between innovation and intellectual property. The authors discussed SDG 8 and SDG 3 as representative examples of how IPRs (1) contribute to achieving the desired results of these goals and (2) enhance the connections between STPs and the cities in which they are located. The article further discussed the benefits of a specialized cluster-based approach for STPs and how events can be organized to take advantage of this structure. The paper concluded with a discussion of the importance of IP and Innovation managers to facilitate these efforts.