

Technology Transfer And SME Access To University IP Assets: Pioneering Approaches In The Italian Landscape

By Stefano Carosio, Fabrizio Dughiero and Andrea Berti

1. Drivers and Barriers for Technology Transfer

There are two main drivers that foster technology transfer from university to industry:

- The sharing of complementary resources in terms of knowledge, human resources and funding;
- A relationship based on trust (normally built in prior experiences of collaboration), commitment, availability as well as shared objectives.

However, there are a number of barriers preventing a systemic collaborative approach, such as:

- Connection problems and use of different “languages.” Talking science to business is not very effective and oftentimes the R&D/Innovation managers are not the best internal sponsors, as they perceive the researcher as the outsider proposing clever solutions they were not able to suggest by themselves, so far. Furthermore, different company functions are used to talk to different research groups inside the Universities, asking only for specific elements of the innovation puzzle (new concepts, talents, access to labs for prototype validation, etc). This creates a wide system of one-to-one relations where many business contacts interact with many university contacts, fragmenting collaboration and limiting opportunities for cross-fertilization and impact generation.
- Lack of mechanisms to address the funding/investment gap. When it comes to industrial funding the tendency is to allocate a person for a given period of time rather than defining a milestone-based approach, where payments can be controlled and even stopped in case of poor delivery. Where public funding is concerned, researchers are often looking for industrial parties to join consortia to access collaborative research programs at local and international scale (*e.g.* Horizon 2020), which can create a possible misunderstanding with regards to the ultimate driver and the real objective of the collaboration.
- Different organizational cultures concerning the different dimensions and drivers of the collaboration between the industrial sector and academia (*e.g.* education, research, consulting, access to IP). For instance, the time horizons for project delivery for universities is normally longer-term, and bureaucracy at university administration is normally less flexible.
- Different perspectives to take up the project results and manage IP. While industry players push for exclusive rights and full control of foreground knowledge, university staff aim at publishing results and keep a more open approach for dissemination among their scientific communities.

2. The Italian University-Industry Collaboration Landscape

Netval, the association gathering most Italian universities

active in technology transfer, performed a survey in 2016 to assess the Italian situation concerning exploitation of university assets and collaboration with industry. The survey highlighted the following:

- The employees of Italian University Technology Transfer Offices (TTOs) are 225;
- Workers engaged in the TTOs have increased by 10 percent compared to 2015, being on average 4.2. According to the authors, this increase was largely due to a national public co-funding scheme issued in 2015 that allowed the TTOs to be able to hire new staff;
- The average number of inventions identified in universities has increased from 10.6 to 11.7;
- The average number of priority applications of universities has increased in recent years, from 5.4 to 6.3. It is quite interesting that the number of applications has increased despite the financial constraints of many universities and the efforts to proceed to patenting with greater selectivity than in the past;
- The average number of patents granted to universities has slightly decreased from 5.4 to 5.1, which is the result of increased selectivity and, probably, the drop in the total number of research staff;
- The total number of patents in the portfolio of the 55 universities that participated in the survey decreased to 3,917, which constitutes a patrimony to which we should ideally add those patents not owned by universities, but in which at least a university researcher is listed as inventor. The average number of patents in the portfolio has increased from 60.1 to 71.2;
- The average expenditure for the protection of IP in universities and public research institutes has increased from EURO 53,400 to 66,300;
- The average number of licenses and/or options concluded by the universities rose from 1.8 to 2.1; for “Top Five” universities the figure is much higher, amounting to 13.2;

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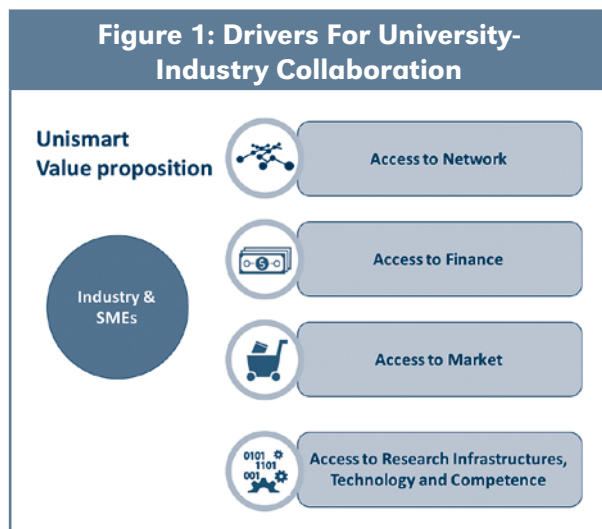
- The average revenue from active licenses from the university has risen sharply, although, on average, still low, around 50 percent have increased from EURO 23,500 to 36,000;
- A reduction in the average number of spin-offs created on an annual basis by universities and public research institutions was identified, from 2.2 to 1.7; as of 31 October 2017, 1373 spin-off companies were operating in Italy.

3. Launching Dedicated Tech Transfer Subsidiaries

All Israeli universities and also some British universities have now 100 percent owned subsidiaries that deal with the Technology Transfer. This solution has been identified by Netval as a possible way forward to support the TTOs in establishing effective collaborations with industry, strengthening the capacity to engage with industry and particularly SMEs.

The University of Padova has pioneered this approach launching a dedicated subsidiary, Unismart, which closely collaborates with the local TTO, being the only commercial, for-profit company fully owned by a university in Italy (so far). We are going therefore to dig deeper into this unique case in the Italian landscape.

The value proposition of Unismart is based on four main elements of high value for business and in particular SMEs, namely access to network, access to finance, access to international markets and access to research infrastructures, technology



and competence, including intellectual property and talents, as highlighted in Figure 1.

Unismart acts in close collaboration with the TTO which is mainly in charge of the internal relationships with the researchers to help them, for instance to identify patenting opportunities as well as supporting them with the filing procedures and contacts with patent attorneys.

Unismart actually acts as a proactive interface between two worlds that have, by their nature, two main drivers often opposed:

- The researchers, driven by the creation of an impact on the needs of society and by progress in their discipline through the publication and dissemination of their scientific work;
- The entrepreneurs or business managers, driven by the search for profit and the satisfaction of market demand through the innovation of its product and service portfolio

and the protection of its intangible assets, which ultimately results in economic growth and employment.

Key players to facilitate collaboration are the so-called innovation champions, researchers who combine scientific excellence with a proper attitude in collaboration with industry. They work closely with the technology transfer managers in each department to foster collaboration with industry. They overall act as:

- Guides in accessing the department's skills and facilities to requests from industry for potential third party research projects;
- Focal points, regarding the involvement of the department's researchers in collaborative research initiatives (e.g. H2020 or regional schemes).

The convergence of these two aspects is fundamental to avoid duplicating the promotional efforts to engage industry with a single value proposition, which should at first aim at establishing a commercial relationship and then scale up projects with the support of public funding, rather than promoting funding opportunities as the main goal of the collaboration.

A critical factor in guaranteeing a smooth collaboration between academia and business concerns confidentiality issues when several players are involved in projects as well as ownership of IP. In this respect Unismart has worked out provisions that are based on the established practices of the university, exposing all single contributors to confidentiality agreements as well as abstracting functionally key elements of the project and guaranteeing in several cases a blind exposure of the customer to avoid that competitors may understand their possible research and development interests. This solid approach has so far addressed most of the toughest requests by business. As far as ownership of foreground knowledge is concerned, this normally follows the provisions set by the university regulations.

In this context, it is clear that the model works only and only if it aligns between the various subjects involved:

- Vision/strategy;
- Resources/infrastructure;
- Delivery mode;
- Coordinated methods of managing business relationships with companies (Customer Relationship Management—CRM).

In particular, it is important to stress that CRM does not mean that Unismart is the only subject dedicated to establishing business relationships between research groups and the outside world, but it is very important to guarantee complete transparency of the contacts and collaborations in place between the University structures and industry in order to create synergies, cross-selling opportunities and improvement based on previous experience.

4. Conclusions and Recommendations

The paper presents an overview of the Italian landscape in technology transfer to industry from universities and more in general public research institutes. Among the different initiatives that are aimed at boosting the TTO capacity, the document highlights the experience made by the University of Padova, which recently launched Unismart as a dedicated subsidiary to closely work with its TTO to strengthen collaboration with industry and SMEs, generating impact at local and international scale. A key asset around the Unismart initiative is the creation of an Open Innovation Community, which is an ecosystem fed by the scientific excellence of the University of Padova as an enabling element for new business opportunities, triggered by the comprehensive networking programme.

In this framework, it is clear the added value of building on consolidated structures within the university, in particular the Technology Transfer Office (TTO), which has a key role in supporting the researchers with a full portfolio of services. The complementarity of Unismart with the TTO is indeed built at the interface between the internal University environment and the outside environment. This is key along with the commitment of the University governance to the implementation of the model which is necessary to get full support within the different steps needed to create a commercial entity as well as the proper bureaucratic framework to speed-up the collaboration mechanisms.

Although the model was *de facto* launched in 2017, the results are indeed very promising with over 70 business contracts signed engaging one-third of the 32 university departments providing not only science and technology, but also non-technological competences like legal or social sciences. Breakeven was reached in 2018 with a cumulative turnover in excess of EURO 3 million within the next 12 months and a staff projected to 15 units in early 2019.

Last but not least, the model is highly scalable and may support those smaller universities in strengthening their commercialization efforts. In this respect Unismart has started establishing collaborations with other Italian universities for IP commercialization as well as signing consulting contracts with some universities outside Italy to support their strategies in technology transfer. ■

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<https://ssrn.com/abstract=3380558>

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