The importance and benefits of the technology transfer ecosystem (TTE)

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ABSTRACT

Creating and maintaining the technology transfer ecosystem is a foundation on which many (future) technology transfers (TTs) are built. Having a good invention/technology is usually not enough, if you do not have either a buyer or a partner on the other side ready to assist you. It is important to establish and maintain (strong) relationships with the industry in order for them to give you the opportunity to present, when the opportunity presents itself, for example in the form of tender/call, innovation, research collaboration etc.

KEYWORDS

Technology transfer, ecosystem, marketing channel, innovate or die, EU, projects, venture capital.

1 INTRODUCTION

The problem, that not so few academic researches institutions face, is the lack of collaboration with the industry. Some even believe that the TT is failing endeavor [1]. There are certain projects that try to stimulate this cooperation/transfer.

One thing, that the Office for industrial liaison (SPOG) at the Jožef Stefan Institute (JSI) observed, that might be responsible for relatively low number of technology transfers, is the lack of "standby" relationships with the industry. This means that it might not be enough to seek for companies when certain tender/call/opportunity presents itself but the organization (or its TT office; TTO) must begin with this (much) sooner.

What SPOG at JSI identified, is that, predictably, the more companies that it visits, the greater the chance for a success story with the benefits for all parties. For example, even if a visited company might not be willing to spend the money on research directly, their topics of potential cooperation are still identified and written down. Also, their skills/areas are cataloged. Then (much) later certain funding opportunities might arise and the SPOG might see the opportunity to connect certain companies with the appropriate researcher or a research team. Some examples of collaborations grew (albeit slowly) from rather small projects like: KET4CP, DIH-World, DIH4AI but through this (small) collaborations, the teams (of researchers and companies) got to know each other and then later applied for or entered into greater projects together.

One of the building blocks of the TT ecosystem (TTE), that we are building at the Project and Innovation Support units (consisting of: Office for substantive project support, technology transfer and innovation (CTT) – U7, Office for industrial liaison (SPOG) – U8, Office for project informatics, organization of thematic events and conferences (SPIK) – U9) at the Jožef Stefan Institute, are certain thematic projects (Enterprise Europe Network, European Digital Innovation Hub – EDIH, KET4CP,…) in which we are involved with precisely this purpose: to help companies in other areas or rather, we are involved in those projects precisely for the reason of helping companies with the cascade financing to cooperate with the Jožef Stefan Institute or in the area of technology transfer. This means that we are actively building (or adding to) our TT ecosystem.

2 THE ECOSYSTEM

Once ecosystem is relatively large enough, further benefits arise. For example, if we successfully connect two companies, they form a partnership agreement (PA) and a stronger/bigger relationship develops as a result. Benefits of a PA, for the company, is an increase in sales abroad, for example, which strengthens the company and its ability to operate more developmentally and innovatively in the future, which then enables the company in the ecosystem to cooperate with a research institution. If this PA was a result of certain project (Enterprise Europe Network for example), then this same project allows the established partnership to be promoted (without any additional charge for the companies) as a success story, which then brings new recognition for all parties (the project itself, companies, project partner) and new opportunities could arise that could (later) involve also the project partner which made the PA of two companies possible. Further developments/opportunities/partnership can arise from either way.

At the Project and Innovation Support units (at the JSI) we are constantly monitoring for new calls/tenders/projects with the objective/question in mind if they can benefit the companies and the researchers. Ideally, they would help with funding, but sometimes they can help even better, by giving them the opportunity or recognition to expand, through connecting certain partners together. It is important to see the whole picture, all of

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the benefits of the ecosystem, the full deck or the full checkerboard in order to be motivated to do certain things that might not give/provide/promise direct/immediate benefit(s) in the first step(s); to the Jožef Stefan Institute in our case. For example, one might ask what's in it for the Institute, to connect certain companies together in the partnership agreement, that might not include the Institute itself. The answer is in the future (probability) of involving the researchers from the JSI in some project, even much later. There are existing cases that speak about this and that can show how further opportunities were developed because of this ecosystem. Opportunities that one might/could not even envision so much in advance. One example of further benefits for the JSI is, since companies are aware of the (EU) funds, they are also monitoring certain project/funding opportunities and since the focus of the (EU) projects is (more and more) on international/abroad cooperation among the companies and involvement of the academia/institutes in a consortium for example, if certain companies would like to either apply for certain project, they would need to involve some (public) research organization for example and if this is the very same organization that helped them (in some ways) before, then there is a greater chance they will contact/include it. The idea/key is to see the potential down the road, to invest time and effort in certain steps that might not yet give direct/immediate benefit. Of course, not every path will lead to new opportunities/partnership but it is important to see it like from a venture capitalists' point of view; if few success stories outweigh the many unsuccessful trials/paths, it was all worth it, in an economic and satisfactory way.

The major problem is the different focus that the parties might have. Researchers in Academia have focus on research and writing/publishing of scientific articles that brings them credits/points that are used for promotion etc. But the industry has a different focus, they (usually) see things from the perspective of ROI (Return of Investment) etc. in a certain period (within 3 years for example). In not so rare cases, both parties could benefit but they need a guidance, case studies, a different overview, for them to see the synergies without any real downsides. For example, the industry could invest (or gain funds for) in something that might be for rather direct application down the line, while the researcher could focus more on a fundamental/part of certain subject. In this way, both parties gain. Scientists/researchers could still be "true to their cause" by researching in fundamental science but the company can then narrow it down to the application. As a result of this collaboration, a new IP (Intellectual Property) might arise and a patent application could get filed, hoping to get to the granted patent (up to 20 times or more research points for the researchers). Based on this IP, in parallel to patent application, the researchers can also write (scientific) article on the very same subject, what is in fact promoted (but a patent application must of course be filed before the publication of the scientific article). So in the end, the researchers could get scientific/publishing credits (for article(s) and patent (application(s)), industry could get the (cutting edge) innovation (and maybe granted patent) that could lead them to more profits and, if all goes very well, the new (foreground) IP could get licensed to the third parties (plural). But it all begins with the proper "selling" to all parties of why they should start to collaborate in the first place and to convince them that they are not on different sides but on the same plane.

3 MULTIPLE ANGLE APPROACH

Transferring technology, into the industry in particular, is a difficult endeavor Companies receive a lot of emails/offers daily and it is difficult to get pass the basic filter/screening and gain their attention, especially for the technologies on a lower technology readiness level (TRL).

It helps to try to establish the relationship with the company first, to know a few people, to recognize the key people, decisions makers, to show them the value of such relationship and then, (much) later, introduce them to new technologies that have a potential but need funding in order to raise its' TRL. And one way of doing exactly that is by presenting/giving the company benefits of some project that is specifically designed to help them in some way. One such project is the Enterprise Europe Network that is founded by the European Commission and its' purpose is to connect the companies together, across the border. It promotes/stimulates collaboration between companies internationally. The connection can happen through connecting them on the business side; via so-called BR – Business Request or BO – Business Offer (one company is ordering/offering services to the other) or connecting them through the particular technology (via so-called TR – Technology Request, TO – Technology offer). Once the companies see the benefit of this, through the established partnership agreements (PA), then their interest increases, relationship deepens and the connector (Jožef Stefan Institute in particular case, that is a Hub in the Enterprise Europe Network) has the option to promote its's services and technology to the companies it helped. Therefore, all the companies, its services, projects, people, become part of the bigger picture, so-called ecosystem. And every (good) system is more than the sum of its parts or greater than the sum of its parts. That might be truer in the case of the ecosystem.

It is of most importance to see the difference between the (isolated) product/service and the ecosystem. One practical example of this is the mobile phone analogy. There are certain phone brands that are of higher price and when comparing just their physical product alone, by specifications, with the competitive products, they might seem high in price. But the important thing here to consider is the additional/surrounding services that are built/integrated with the device: stores, music service, cloud storage, synchronization, backup, location service, … With this different overview, the mobile product is not just a (overpriced, comparing just by physical) device but it is the (part of a) mobile ecosystem. Similarly, if one views technology-transfer office (TTO) just as a "forwarding service", that forwards certain email/inquiry and establish contact, it might be harder for them to justify its size/function but if one sees the full spectrum of benefits of the TTO, then they will almost not want to do the contact/service themselves.

Sometimes researchers think that it would be better to contact certain company directly and not via TTO, especially if that is allowed in the organization. But this might show problems down the road, especially if there is a higher money involved. Particular field when something might get wrong is the legal field, when drafting/signing the contract of potential collaboration. If the relationship between organizations is

established without the contract, that has its own problems since many things are undefined (for example use of logo/brand/name, background IP etc.). Also, it is important to have companies on stand-by, for certain tenders/opportunities which are hardly maintained by individuals and this is where the TT ecosystem comes in play.

As we see, it is important to have a established (organic) ecosystem of technology transfer with all the essentials, such us: legal assistance (drafting the contracts, managing the signing procedures), intellectual property (IP) rights guidance/management, informing companies of certain funding/financing and networking opportunities, organizing brokerage events, publishing and promoting profiles (offers, requests) online for the companies that are in need of product/service/research/technology or are looking to sell product/service/technology, mediating/stimulating negotiations (which is very critical in the beginning stages), mediating or "translating" between academia/researchers and companies/industry since there is a usually a very different language/focus between the two, etc.

4 RESULTS AND DISCUSSION

It appears that one of the more effective ways, for the industry and academia to meet, is building and maintaining the TT ecosystem with promoting of value added for all parties. The researchers might get (scientific) credits while the industry (companies) can increase their profits, either directly (by optimizing certain parameters in certain areas: production, logistics, material use etc.) or by gaining some technological advantage (through innovation) in the market.

The innovation is still one of the leading forces of progress or marketing advantage. "Innovate or die" is the motto by which many high-tech companies are driven by. The "host" for this collaboration is a so-called TT ecosystem in which the relationship between academia (and basic science institutes) are formed, maintained and stimulated. It is important to have as much industry and researchers identified/catalogued and connected as possible. Not unusually, the collaboration starts even years after the first contact, when the right opportunity arises or something/management change. It is important to design the organization around the idea of the importance of the TT ecosystem. [2]. At the Jožef Stefan Institute there is a mentioned group of support units, known as Project and Innovation Support, that help to promote the TT idea itself and that also do (bi)weekly visits to Slovenian companies, that are pre-identified/screened as having (the research department/potential) with witch the group try to identify topics of possible cooperation and then try to match it with the researches at the Jožef Stefan Institute or, if there is no match at the JSI, with the potential partners abroad. Potential topics/opportunities get forwarded, with the help of Enterprise Europe Network project, to other organization (abroad) due to the lack of resources at the Jožef Stefan Institute. At the first glance, this would seem as an opportunity wasted but due to this TT ecosystem idea, not so few times, the opportunity (later) comes from a different path. For example, the company that we connected with the company/Institute abroad, later came back with the request for a direct research cooperation or with the invitation to certain tender/call. The company, although had no direct relationship with the Jožef Stefan Institute itself, later realized the value added of the Institute and reached it for another opportunities. The important thing is to keep ecosystem alive, to circle ideas and opportunities and sooner or later, due to pure statistics - if nothing else, the seed of (another) opportunity begin to sprout in the soil of the originator.

5 BEST PRACTICES

One of the recent good examples or best practices, is the successful collaboration (that is ongoing and is evolving) between the researchers from JSI and Slovenian company with registered research group under the Slovenian Research Agency: ARIS. On the other side were the researchers from JSI. The whole collaboration started when the TTO/TTE sent particular funding opportunity to sourced companies that they believe would be suitable. Once the company expressed interest and the technology needed by the SME was defined, the TTO/TTE located the appropriate researchers at the JSI. After the meeting, they agreed to apply for particular project together. After they won the project and completed it, they later applied for a different project of similar size. By this time, they got to know each other quite well and they started to think/brainstorm, during one particular teleconference (TTO was guiding it), that maybe they should not just be looking/applying for certain projects, now that they found they are a good research consortium, but to propose it/them. The idea then gained track, they filed a proposal for a fundamental project and won it. The company got the funds, the researchers got the funds but also, due to fundamental project, researches will have the benefit to work on the fundamental research, which is their main purpose at the institute, to publish, to get research credits etc. The company got the material/base that they can upgrade to more applicable/marketable version of the subject. All parties win. All this all due to the organic progress of relationship between the Institute and the company. With such established relationship, specially with the ongoing support from the TTE, the possibilities/options increased greatly and also there is a potential for the foreground Intellectual Property (IP), further commercialization of joined (secret)know-how or IP etc.

6 CONCLUSIONS

Benefits of the Technology transfer ecosystem are hard to envision at first but the more one work with(in) it, the greater the benefits presented. Many ask what is the purpose for a (basic) research institute to connect the companies and opportunities (specially abroad) but at the end there are many. By visiting companies, identifying their challenges, connecting them with other companies/institutions (abroad), that could solve their challenges, every once in a while, those companies (either domestic or abroad) remembers the originator (the Jožef Stefan Institute in this example) and enters into a research partnership or apply together for great(er) projects in (fundamental) research with the potential for further direct applications. Therefore,

everyone gains. EU also seem to support Improved technology transfer ecosystem and networks across Europe [3].

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