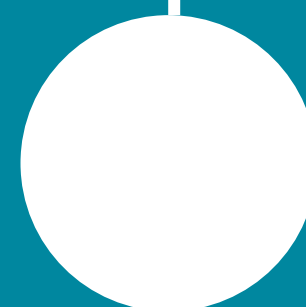




GUIDELINES BY

Vojtěch Nosek | Vojtěch Kadlec



**National Technology
and Knowledge
Transfer Guidelines**

www.unico.ai

TTOs models

The **model of functioning** of TTO at each HEI and PRO **must be aligned with the overall ambition and available resources of technology and knowledge transfer.**

Clear goals of technology and knowledge transfer must be formulated by management in order to align expectations of all people involved and keep them motivated

Central TTO

- for one HEI or PRO with administrators at each faculty/department
- central policy, rules and processes
- **Advantages:** effective thanks to sharing resources, it is easier to communicate with industry
- **Disadvantages:** experts have not close relationship with researches - only general knowledge about expertise and IP portfolio
- Must be service-oriented

Smaller TTO office at each faculty/department

- **Advantages:** More flexible, and closer to researchers; easier to communicate the strategy and rules
- **Disadvantages:** HEI or PRO cooperation is fragmented and multidisciplinary projects are difficult to organize; Usually do not have enough resources to offer high quality services
- Must have at least one central administrator if HEI or PRO is one legal entity

Regional TTO

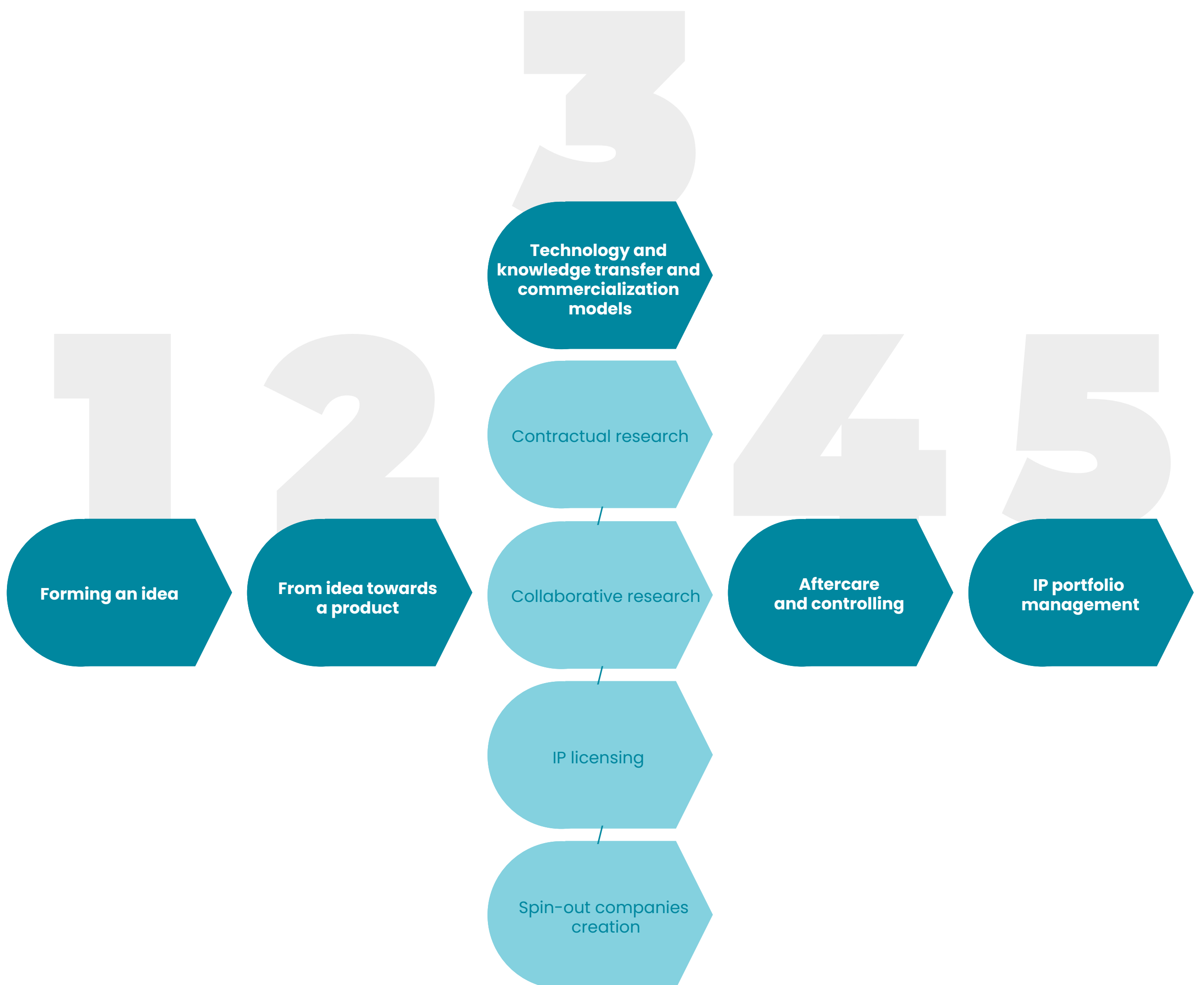
- might be a suitable model when there are not enough technology and knowledge transfer opportunities and/or when the resources at individual HEI or PRO are limited
- **Advantages:** business experts available, IP and expertise portfolio can be more effectively communicated towards industry
- **Disadvantages:** experts do not know the researchers, difficult to map all the IP and expertise
- Must very clearly communicate the expectations and clarify roles of all parties involved
- Must have a scout or at least administrator at each HEI or PRO

TTO as a Special Purpose Vehicle (SPV) fully owned by the HEI or PRO

- **Advantages:** a private company: the processes are much simpler when negotiating with the private sector; much faster
- **Disadvantages:** complicated to set up; communication between researchers and SPV as external body may be problematic
- Must be service-oriented; Must be sure it does not conflict with its own internal rules.
- Must very clearly communicate the expectations with management and must clearly define powers and responsibilities (including KPIs) of the SPV management.

National Technology and Knowledge Transfer Process Step by Step

There are **five basic stages of technology and knowledge transfer:**



Forming an idea



Research design

- The HEI or PRO must understand how to design research with application potential.
- The research design should start with a review of the state-of-the-art.
- Research design might reflect also local specialization—such as smart specialization—to have a better chance to succeed.
- Application research design is not a one-off process.
- Commercialization is often the most successful when the project is designed based on some concrete need of an industrial partner.
- The research design must not be underestimated even during a contractual or collaborative research.

Internal communication

- It is crucial to communicate technology and knowledge transfer rules within each organization to all researchers.
- TTOs may organize regular meetings with researchers interested in technology and knowledge transfer.
- TTOs may consider employing a communication manager who would be responsible for all communication channels.
- The internal communication is especially important during collaboration and contractual research. The research progress must be monitored internally and communicated regularly with partners.

Popularization and further education

- Best practice examples and success stories should be presented to boost researcher motivation to engage in technology and knowledge transfer activities.
- Basic technology and knowledge transfer rules, such as patenting principles, should be part of students' curricula.
- There are other possibilities how to popularize technology and knowledge transfer. TTOs may organize hackathons, info days for companies (partners), specialized seminars where companies present their business, etc.

Monitoring capacities and projects

- All internal experts (researchers) and other capacities must be monitored. The TTO must have a good evidence of internal scientific capacities.
- TTOs should have an internal database of researchers.
- In case there are active commercialization projects, there should be internal evidence with specification about the current phases each project is in and with further steps planned.
- Regular internal meetings with the most promising research teams should be organized.

From idea towards a product



When researchers bring a new idea, which was well-designed and potentially solves an important societal problem, the road to a product is very long. TTO must help researchers to understand this challenge and be able to help them to deal with it.

Ownership – invention and its protection

- All inventions developed by employees in Croatia need to be reported to the employer.
- In case HEI or PRO management decides not to proceed with a protection of an invention and its commercialization, the ownership rights may be transferred to inventors.
- The IPR must be fully in line with legislation, especially in the case of spin-off companies, which have the ambition to attract angel or venture capital.
- TTO must closely monitor the ownership and must address all legal aspects before negotiation with industrial partners.
- In case the IP is co-owned, the co-ownership must be accompanied by a contract.
- The IP ownership is highly relevant even in case of contractual and collaborative research.

Validation (technical, legal, business)

- The technical quality validation is usually done by the research team, but TTO should be able to help methodologically.
- The legal quality validation demonstrates that the project or invention has a unique protectable features (patentability), or at least that it is not in conflict with other solutions (freedom-to-operate).
- Business validation should be done during the research, not after the research is completed, because it often brings important insights from the market and the research can be adjusted accordingly.
- TTO should be able to help researcher with the business validation, at least with a basic analysis.
- External experts organized by TTO into a Commercialization Committee might be used to validate the business potential of ideas/technologies.

Commercialization agreement

- Commercialization needs to be transparent for each party involved; thus TTO should have a written agreement between all parties.
- The commercialization agreement should also specify how the potential revenues will be distributed.
- The commercialization agreement should specify milestones to keep the TTO as well as the researcher committed: Filing the patent application; Undertake a valuation; Detailed market analysis; Start negotiating with first potential client; Prepare license agreement or termsheet first draft

From idea towards a product



Intellectual Property Protection

- TTO should prepare a cost-benefit analysis to identify which ideas are worth protecting with a patent.
- Not all ideas are suitable for a patent protection, but other forms of IP may be applicable. TTO and researcher must understand the difference between patent, utility model, design patent, trademark, and know-how.
- TTO must always consider the quality of the patent attorney.
- In cases where the PRO or HEI decides the idea is not worth commercializing, the researcher should be able to proceed with the commercialization if he or she still believes it can be successful.
- In case of IP co-ownership with industrial partner, the roles during the IP protection process must be agreed on, including the patent attorney selection, patent quality assessment (FTO, patentability, enforceability), financing etc.

Valuation

- **TTO must be able to help researchers to value their projects or have external partners to do so.** TTO may have templates and guides for researchers so that they are able to perform a basic valuation themselves. there are several possibilities to provide an estimate: cost based valuation, analogy valuation, market based valuation. The choice of a specific method is very individual and depends on available data.
- Valuation should be performed by an external party in case of spin-offs to manage conflicts of interest. The valuation and cost-benefit analysis (CBA) significantly helps during negotiations with industrial partners.

Technology and knowledge transfer and commercialization models



There are many types of technology and knowledge transfer and commercialization. Each individual case is suitable for a different type.

At the beginning of a commercialization, TTO must understand specifics of dealing with a private sector in contrast to academic processes. **It is crucial to react quickly, flexibly and transparently.**

Contractual research

- The TTO should map the PRO or HEI's internal expertise and capacities to be able to match them with opportunities for contractual research. Contractual research is often a first step for more complex partnerships. The PRO or HEI's internal expertise should be well mapped.
- Marketing of expertise and specialized equipment is useful if the demand is not very strong yet, especially when there are not many success stories yet.
- Before each contractual research, the TTO must consider potential future IPR. TTO should include license clauses in each contractual research no matter how unlikely it is some IP will emerge.
- In each contractual research, TTO must have a pricing calculation.

Collaborative research

- Collaborative research is a complex collaboration between HEI or PRO and industrial partner. TTO should sign a collaborative research agreement.
- TTO must go into detail (and EU legislature) when they choose a specific collaborative research type:
 - **Fully covered by public sources (fully state-funded research):** HEI or PRO will own IPR arising from the research
 - **Fully covered by industrial partner:** the industrial partner is entitled (according to law) an exclusive license or non-exclusive royalty free license of the Foreground IP arising from the collaborative research.
 - **Partly covered by industrial partner:** the terms of IP ownership are agreed among parties and it is especially important that TTO signs a collaborative research agreement before the project starts

Technology and knowledge transfer and commercialization models



IP licensing

- TTO may prepare some typical licenses as templates although each license is different and preparing templates is difficult.
- TTO must define the object of a license agreement well.
- It is important to distinguish between exclusive and non-exclusive license.
- The pricing (license fees and their distribution in time) must reflect other license terms.
- If there are royalties, they must be precisely defined.
- Each license must have a duration and specific terms regarding premature termination.
- The license agreement must specify what happens when the Licensor or Licensee improves the object of the agreement.
- It is advisable for the TTO to include free license for PRO or HEI for academic and teaching purposes both in cases of exclusive and non-exclusive license agreement.
- The license agreement is rarely easily transferable without additional services by the Licensor.
- There are several challenges when preparing a license agreement. Addressing these challenges is crucial in the contracting process
 - What is being licensed?
 - Is the contract fair (win-win)?
 - How is the future improvement clause dealt with?
 - How much licensee pay a how it was calculated?
 - Isn't the contract too complicated?

Technology and knowledge transfer and commercialization models



Spin-out companies creation

- Some ideas have a wider market potential and can be commercialized in a form of a spin-out – a newly created company, which can have several forms.
- The commercialization, and specifically spin-offing, can be supported by a specific SPV spin-off – a company 100% owned by the PRO or HEI.
- The spin-off's founders—researchers—are usually technical experts and often lack business skills, which must be complemented.
- In order to support spin-off creation, TTO and/or SPV must be linked to angel and venture ecosystem.
- Similar to licensing, the spin-off should start with a termsheet, defining all stakeholder's roles, the general strategy of the spin-off and monetization strategy.
- If the spin-off has exit potential, the TTO should consider introducing success fee for the PRO related to the exit.
- Founders are advised to have a Shareholders Agreement. The founder of the spin-off may often have clash of interests with their work at PRO or HEI. TTOs must deal with this transparently and fully.
- Whence PRO/HEI is successful in spin-off creation, TTO must be able to manage its portfolio (and/or equity) well.

Aftercare and controlling



- For sustainable and long-term successful tech transfer, the cooperation does not end with the contract signed nor the project termination.
- In order to have a good long-term relationship with all partners, TTOs should have a Customer Relationship Management (CRM) tool.
- The TTO may attract new partners, and keep the existing partners engaged, through social activities and similar activities. For example, speed dating often proved to be a very successful model.
- TTOs may also prepare a long-term partnership program with defined rules, access to students, access to research etc.
- So-called University labs are another example how TTO may effectively engage with industrial partners. This concept offers companies a virtual space at PRO or HEI, where the company can present its challenges.

IP portfolio management



- Besides digital evidence of researchers, expertise, equipment and commercialization projects, TTO should have evidence of general intellectual property portfolio.
- TTO should re-assess the patent life-cycle costs on a yearly basis.

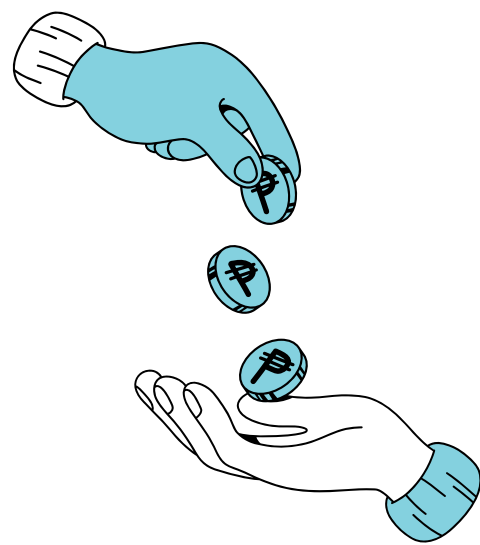
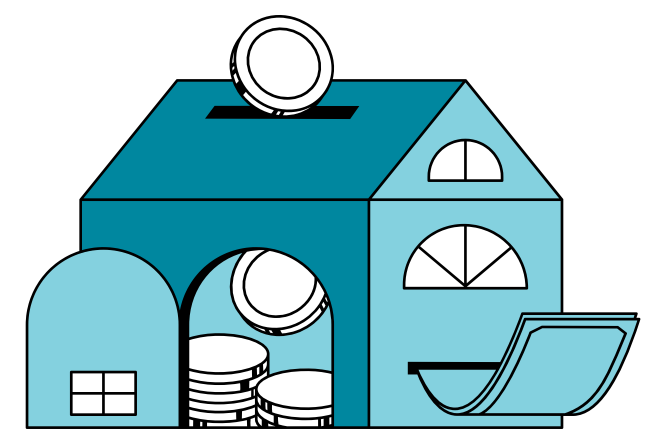
Models of technology and knowledge transfer financing

TTOs can either be **set-up to predominantly create income for their institutions, or to exist as a service infrastructure for the institutional staff in the field of TT**. In both cases, the TTOs are originally funded by HEI or PRO institutional resources. When TTO aims to finance its operation partly from revenues from technology and knowledge transfer, TTO must prepare suitable financial processes in the institution.

Public funding

There are some activities, which is difficult, especially in the less mature ecosystems, to finance internally or commercially. Usually, these types of activities are subsidized on the national level. These processes include especially the following: Proof-of-concept projects, IP protection, and IP valuation.

There are several possibilities how to finance technology and knowledge transfer through international public projects.



Funding from industry

When there is not enough institutional funding, TTO should put more effort into partnerships with private sector.

TTO may also consider to introduce a sponsorship program. TTO can prepare benefits for private companies (such as access to students, University labs, PR promotion etc.) in exchange for small recurrent fees.

When there is an excellent research group, there might be a possibility to have a direct sponsorship from industry.

Angel and VC funding

Business angels can rarely bring operational money but in a long-term perspective, it can significantly increase a success rate of spin-outs.

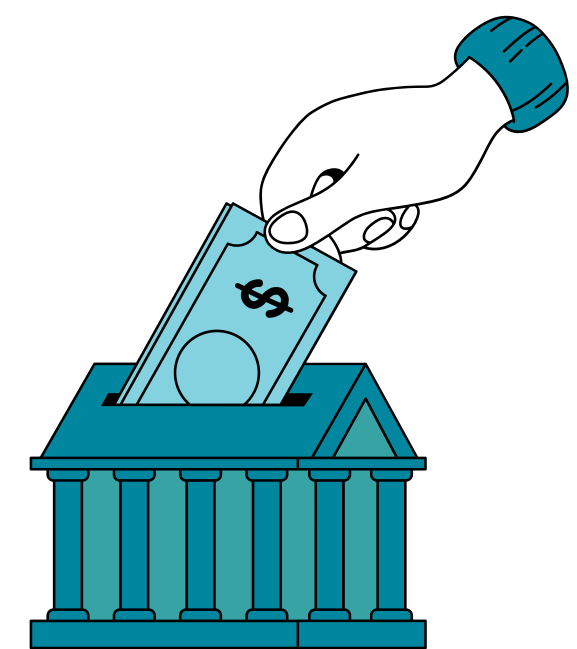
TTO may partner with business angels and venture capital funds. These angels and venture capital funds can bring capital necessary for spin-out creation.

TTO should have a portfolio of technologies suitable for spin-out creation available.

TTO must ensure that all internal processes (including legal obligations) are met since investors perform very rigorous due diligence and each shortcoming is sooner or later addressed.

TTO may gather feedback on technologies (potential spin-out) from external partners, such as from a commercialization committee.

In case spin-creation is one of the main goals within the technology and knowledge transfer strategy, TTO should consider to becoming a member in some international networks of business angels and/or venture capital networks.



Financing TTOs lean

The role of TTO is very complex and the administration of the whole agenda often costly. However, the lean approach may help to balance the performance and costs.

Always try to start with small actions and follow up with more ambitious goals.

Have excellent evidence of internal research capacities and excellence and attract inbound demand.

Be ready to do TTO piloting – test what functions well and what not and adjust the TTO agenda accordingly.

Outsource the lengthy yet relatively standardized tasks.

Business validate all technology and knowledge transfer activities and choose to support only the projects with significant business potential – save time for activities you can have the biggest impact.

Choose the most excellent teams and aim for sponsored research.

Connect with other HEI or PRO and pitch your expertise together.

Setting-up TTO as a spin-off can help to introduce this business oriented lean approach.

thank you

WE DELIVER



KRAKOVSKÁ 24
PRAHA 1

www.unico.ai

vojtech@unico.ai