Iceland Liechtenstein Norway grants

jctt Jihočeské Univerzitní a Akademické centrum transferu technologií

Knowledge Transfer Specifics in Research Organizations

RNDr.et Mgr. Růžena Štemberková, Ph.D., MPA a kolektiv

České Budějovice 2023

Table of Contents

1 Introduction to knowledge transfer in the university environment

The role of the university is not limited to teaching and research, but includes a third role and another academic mission, namely to engage with society. In addressing the growing social and economic challenges, research institutions everywhere are facing a growing demand for the integration of their research and teaching expertise related to this so-called third role of universities and the so-called mission. The 'third mission' is not just a phrase but is increasingly important in shaping the relationship between academia and the commercial sphere in its various forms. Being part of Vision 2030 and beyond and supporting the knowledge economy requires a greater emphasis on the links between universities and industries and the products related to their research.

This is a clear challenge for the majority of newly established transfer centers (mostly by 2012) at universities in the Czech Republic. The main impulse to change this relationship comes from the Czech government through the Ministry of Education, Youth and Sports to promote the knowledge economy and link R&D results towards the commercial sphere, as well as to link impulses, current challenges and problems addressed in the corporate sphere towards the university.

1.1 Definition of research

As in any discipline, knowledge and technology transfer uses a specific language. For the sake of clarity, let us list the basic meanings of the most important terms:

Research and development - according to the Frascati Manual (OECD, 2015) research and experimental development (R&D) consists of creative/creative and systematic work carried out to increase the level of knowledge, including knowledge of humanity, culture and society, and to devise new ways of applying available knowledge. The goal of research is always new knowledge, based on original concepts (and their interpretation) or on hypotheses. R&D is, by definition, always largely uncertain as to the final outcome (or at least the amount of time and resources needed to achieve it) and is aimed at producing results that could be either freely transferable or traded on the market. R&D must fulfil five basic criteria:

- the activity must contain an element of novelty,
- must be creative/creative,
- contain an element of uncertainty,
- be systematic,
- be transferable and/or reproducible.

R&D includes three categories of activities - basic research, applied research and experimental development.

The order in which these three categories of R&D activities appear is not intended to suggest that basic research leads to applied research and then to experimental development. There are many flows of information and knowledge in the R&D system. Experimental development can inform basic research and there is no reason why basic research cannot lead directly to new products or processes.

Basic research (according to OECD (OECD, 2015)**)** - Experimental or theoretical work carried out primarily to gain new knowledge about the basic principles of phenomena or observable facts and not primarily aimed at any specific application or use in practice.

> Basic research analyses properties, structures and relationships with a view to formulating and testing hypotheses, theories or laws. The mention of the absence of a "primary focus on a specific application or use in practice" in the definition of basic research is very important because the researcher may not be aware of possible applications when conducting the research or completing the survey questionnaires. The results of basic research are generally not sold but are usually published in scientific journals or disseminated to interested colleagues. Sometimes the publication of basic research may be restricted for reasons of national security.

In basic research, the researcher is expected to have some freedom in setting objectives. Such research is usually carried out in the university sector, but also to some extent in the government sector. Basic research may be oriented or focused on some broader areas of general interest, with the explicit aim of a range of future applications. Commercial enterprises in the private sector may also carry out basic research, as even here no specific commercial application may be foreseen in the short term. Research on certain types of energy saving technologies can be characterized as basic according to the above definition, unless it has a specific practical application. However, it has a specific direction, namely to increase energy savings. Such research is referred to in this manual as 'oriented basic research'.

Oriented basic research can be distinguished from "pure basic research" as follows:

- Pure basic research is carried out in the interest of advancing knowledge, without seeking economic or social benefits or actively seeking to apply the results to practical problems or to transfer the results to the sectors responsible for their application.
- Oriented basic research is conducted with the expectation that it will generate a broad base of knowledge that could form the basis of solutions to identified or anticipated current or future problems or opportunities.

Basic research (according to the EC (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022)**)** is experimental or theoretical work carried out primarily for the purpose of obtaining new knowledge of the fundamental principles of phenomena and observable facts, and not aimed at direct commercial application or exploitation;

Applied research (according to OECD (OECD, 2015)**)** - original research carried out with the aim of gaining new knowledge. However, it is primarily directed towards a specific practical aim or objective. Applied research is carried out either to identify possible applications of basic research findings or to establish new methods or ways of achieving specific and predetermined objectives. It also means considering available knowledge and extending it to solve current problems. In the business sector, the distinction between basic and applied research is often marked by the creation of a new project to explore the promising results of a basic research programme (and a shift from a long-term to a medium-term perspective in the in-house exploitation of R&D results. The results of applied research should be primarily aimed at possible applications in products, operations, methods or systems. Applied research gives ideas a form that can be used in operations. These applications of derived knowledge may be protected by intellectual property protection tools, **including confidentiality**.

European definitions (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) states that it is a collective term for industrial research, experimental development or a combination of both. Czech legislation (Act No. 130/2002 Coll. on support for research and development from public funds, 2002) defines applied research as theoretical and experimental work aimed at acquiring new knowledge and skills for the development of new or substantially improved products, processes or services.

Applied research according to the EC (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022)**)** is industrial research, experimental development or a combination thereof.

> **Industrial research** means planned research or critical investigation aimed at acquiring new knowledge and skills for the development of new products, processes or services or for the substantial improvement of existing products, processes or services, including digital products, processes or services, in any field, technology, industry or other sector (including, but not limited to, digital industries and technologies such as supercomputing, quantum technologies, blockchain technologies, artificial intelligence, cybersecurity, big data and cloud computing technologies).
>
> Industrial research involves the creation of sub-assemblies of complex systems and may include the production of prototypes in a laboratory environment or in an environment with

simulated interfaces with existing systems, as well as the production of pilot lines where necessary for industrial research and in particular for general technology validation.

Experimental development (according to OECD (OECD, 2015)**)** - systematic work, drawing on research findings and practical experience and producing further knowledge, which is aimed at creating new products or processes or improving existing products or processes.

The development of new products or processes qualifies as experimental development if it meets the criteria for identifying research and development activity. An example is uncertainty about the resources needed to achieve the objective of a research and development project involving development activity. In this manual, the 'D' in the English abbreviation 'R&D' refers to experimental development.

The concept of experimental development should not be confused with "product development", which is the overall process - from the formulation of ideas and concepts to commercialization - aimed at bringing a new product (good or service) to the market. Experimental development is only one possible stage in the product development process: that is, the stage where general knowledge is actually tested for the specific applications needed to bring the process to a successful conclusion. During the experimental development phase, new knowledge is generated and this phase comes to an end when the R&D criteria (novelty, uncertainty, creativity, systematicity, transferability and/or reproducibility) no longer apply.

The concept of experimental development should not be confused with "pre-production development", a term used to describe non-experimental work on a defence product or a product or system intended for use in space, before it goes into production.

Experimental development (according to the EC (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022)**)** is the acquisition, combination, shaping and application of existing scientific, technological, commercial and other relevant knowledge and skills for the purpose of developing new or improved products, processes or services, including digital products, processes or services, in any field, technology, industry or other sector (including, but not limited to, digital industries and technologies such as supercomputing, quantum technologies, blockchain technologies, artificial intelligence, cybersecurity, big data and cloud or edge computing technologies).

For example, this may include activities aimed at defining the concept, planning and documentation of new products, processes or services. Experimental development may include the development of prototypes, demonstration activities, pilot projects, testing and validation of new or improved products, processes or services in an environment representative of realistic operating conditions, where the main objective is to further technical improvement of products, processes or services that are largely undefined.

These activities may include the development of a commercially viable prototype or pilot project which is necessarily a final commercial product and which is too costly to produce to be used for demonstration and verification purposes only. Experimental development does not include routine or periodic changes to existing products, production lines, manufacturing processes, services and other work-in-progress operations, even though these changes may represent improvements.

The boundary between basic research, oriented research and applied research and development is very blurred and different in terms of disciplines, especially as perceived by different national funders or regulatory bodies. The ambiguity of interpretations and approaches has a major impact on the assessment of research quality and funding opportunities. To improve understanding and clarification, let us recall the illustrative examples given directly in the internationally recognized OECD guidance material, the Frascati Manual:

The study of a given class of polymerization reactions under different conditions is fundamental research. Attempting to optimize one of these reactions to produce polymers with given physical and mechanical properties (with the aim of achieving a specific use value) is applied research. Experimental development then consists of bringing a process that has been optimized at the

laboratory scale to the production scale and investigating and evaluating possible ways of producing the polymer, as well as the products to be made from it.

Modeling the absorption of electromagnetic radiation by a crystal is fundamental research. Studying the absorption of electromagnetic radiation by this material under different conditions (e.g. temperature, presence of impurities, concentration, etc.) in order to obtain given radiation detection properties (sensitivity, speed, etc.) is applied research. Testing a new device using this material, with the aim of obtaining a better detector than existing ones (in the spectral range considered), is experimental development.

The development of an entirely new method for the classification of immunoglobulin sequences is fundamental research. Research carried out in an attempt to distinguish antibodies to different diseases is applied research. Experimental development then consists of creating a method for synthesizing an antibody against a particular disease based on knowledge of its structure and clinical trials of the effectiveness of the synthesized antibody on patients who have agreed to the experimental advanced treatment.

The study of how the properties of carbon fibers might change depending on their relative position and orientation in the structure is fundamental research. The controlled development of methods to enable industrial-scale processing of carbon fibers with nanoscale precision could be an outcome of applied research. Testing the use of new composite materials for different purposes is an experimental development.

The search for alternative methods of computation, such as quantum computing and quantum information theory, is fundamental research. Exploring the application of information processing in new areas or in new ways (e.g. developing a new programming language, new operating systems, program generators, etc.) and exploring the application of information processing to develop tools such as geographic information and expert systems are applied research. The development of new software applications and significant improvements to operating systems and application programs are experimental development.

The study of sources of all kinds (manuscripts, documents, monuments, works of art, buildings, etc.) in order to better understand historical phenomena (political, social, cultural development of a country, biography of an individual, etc.) is fundamental research. A comparative analysis of archaeological sites and/or monuments displaying similarities and other common characteristics (e.g., geographic, architectural, etc.) to understand connections of potential relevance to teaching materials and museum displays is applied research. The development of new instruments and methods for studying artifacts and natural objects discovered by the work of archaeologists (e.g. to determine the age of bones or botanical remains) is experimental development.

In the field of agricultural sciences and forestry:

Basic research: researchers investigate genome changes and mutagenic factors in plants to understand their effects on the sum of phenotypes. Researchers study the genetics of plant species in the forest in an effort to understand the natural regulation of resistance to disease or pests.

Applied research: researchers are examining the genomes of wild potatoes to find genes responsible for resistance to potato blight in an effort to improve resistance to the disease in domestic/planted potatoes. Researchers are planting experimental stands where they are changing the spacing and arrangement of trees to reduce the spread of the disease while ensuring optimal composition for maximum yield. q

Experimental development: researchers create a gene editing tool using knowledge of enzymatic DNA editing. Researchers apply existing research to specific plant species with

the intent of creating a plan to improve how the owner plants his forests to achieve a specific goal.

In nanotechnology

Basic research: researchers study the electrical properties of graphene using a scanning tunneling microscope to see how electrons move through the material as a function of voltage changes.

Applied research: researchers study microwaves and thermal coupling with nanoparticles to properly align and arrange carbon nanotubes.

Experimental development: researchers apply research in the micro-manufacturing industry to develop a portable and modular "micro-production" system with components, each of which is a key part of an assembly line.

In computer and information sciences:

Basic research: research into the properties of general algorithms for real-time transmission of large amounts of data.

Applied Research: research in finding ways to reduce spam by understanding the entire design or business model of spam, what spammers do and their motivations for sending spam.

Experimental development: the start-up takes the code developed by the researchers and develops a business case with the aim of obtaining a final software product to improve online marketing.

In Economics and Business:

Basic research: a review of theories on the factors determining regional differences in economic growth. Economists conducting abstract research on economic theory that focuses on determining whether there is a natural equilibrium in a market economy. The development of new theories of risk.

Applied research: analysis of a special regional case for government policy development. Economists investigating the properties of an auction mechanism that could be relevant for telecommunications spectrum auctions. Exploring new types of insurance policies to cover new market risks or new types of savings instruments.

Experimental development: developing functional models based on statistical data to design economic policy instruments to support the region's growth. Development by or for the national telecommunications authority on how to auction telecommunications spectrum. The development of a new way of managing an investment fund is an experimental development if there is sufficient evidence of originality.

In the field of education:

Basic research: analysis of environmental factors on learning ability. Research on manipulative factors, conducted by researchers, in which standardized instruments are used to determine how much first graders learn in a mathematical strategy through different pathways when these manipulative factors are varied.

Applied research: comparative evaluation of national education programmes aimed at reducing the learning gaps experienced by disadvantaged communities. A study of researchers implementing specific curricula in mathematics education to determine what teachers need to know to successfully implement the curriculum.

Experimental development: development of tests to select which educational program should be used for children with special needs. Development and testing (in the classroom) of software and support tools, based on fieldwork, to improve mathematical cognition (field of cognitive psychology) for special education students.

In Social and Economic Geography:

Basic research: researchers seek to understand the underlying dynamics of spatial interactions.

Applied research: the research study analyses the spatio-temporal patterns of transmission and spread of an infectious disease in the event of an outbreak.

In the field of history:

Basic research: historians study the history and impact of glacial melt on humanity.

Applied research: historians examine how societies in the past have responded to catastrophic natural events (e.g. floods, droughts, epidemics) to understand how contemporary societies might better respond to global climate change.

Experimental development: using previous research results, historians will design a new museum exhibit on the adaptation of past human societies to environmental changes; this exhibit will serve as a prototype for other museums and educational facilities.

In the field of languages/linguistics:

Basic research: linguists study how different languages interact when they come into contact with each other.

Applied research: speech-language pathologists investigate the controlling neurology of language, and how people acquire language skills.

Experimental development: linguists are developing a tool to diagnose autism in children based on their language acquisition, retention and use of signs.

In music:

Basic research: researchers develop a transformational theory that provides a framework for understanding a musical event not as a collection of objects that have a special relationship to each other, but as a series of transformational operations applied to the underlying material of the work.

Applied Research: researchers use historical records and experimental archaeology techniques to recover an ancient and long-lost musical instrument, to determine how it would have been constructed, how it was played, and to determine the sounds it made.

Experimental development: music educators and theorists are working to develop new pedagogical materials based on new discoveries in neuroscience that are changing our understanding of how people process new sounds and information.

It is highly recommended to read other parts of the Frascati Manual, especially to define the boundaries between R&D, innovation and other activities, including very practical examples. For example, the definitions in the field of computer software, or education and training, are very instructive.

1.2 Other useful terms

Application sphere - any organization or entity outside the original research organization (university) in which the results of research activities can be applied. The application sphere thus includes not only industry and companies, but also, for example, other research and development institutions, non-profit organizations, hospitals, state and public administration.

Infrastructure for testing and experimentation - facilities, equipment, capacities and resources such as test benches, pilot lines, demonstration facilities, test facilities or live laboratories, and related support services, which are used predominantly by enterprises, in particular SMEs, applying for support to test and carry out experiments to develop new or improved products, processes and services and to test and disseminate technologies to advance industrial research and experimental development. Access to publicly funded testing and experimentation infrastructures shall be open to multiple users and shall be provided on a transparent and non-discriminatory basis and on market

terms. Testing and experimentation infrastructures may also be known as technology infrastructures.

Non-economic activities of research organizations in terms of public support (not tax liability):

a) primary activities of research organizations and research infrastructures, in particular:

   i. training to increase the numbers and improve the skills of human resources. It considers public education organized within the state education system, which is largely or wholly financed by state resources and controlled by the state, to be a non-economic activity.

   ii. Independent R&D to gain new knowledge and better understand the topic, including collaborative R&D where the collaboration involving the research organization or research infrastructure is effective.

   iii. public dissemination of research results on a non-exclusive and non-discriminatory basis, for example through teaching, open access databases, publicly available publications or open-source software.

b) **knowledge transfer** activities, provided that they are carried out either by or on behalf of the research organization or research infrastructure (including their departments or branches) or jointly with or on behalf of other such entities and that any profits from such activities are reinvested in the primary activities of the research organization or research infrastructure. The non-economic nature of these activities shall be maintained even if the supply of the corresponding services is entrusted to third parties through an open procurement procedure.

Arm's length - a situation where the terms of the transaction between the parties do not differ from those that would be agreed between independent undertakings and do not involve an element of collusion. The arm's length principle is considered to be satisfied in the case of a transaction preceded by an open, transparent and non-discriminatory procedure.

Research and knowledge dissemination organization or research organization - an entity (e.g. a university or research institute, a technology transfer agency, an innovation intermediary, a physical or virtual collaborative research entity), regardless of its legal status (established under public or private law) or method of funding, whose main objective is to carry out independently basic research, industrial research or experimental development or to disseminate publicly the results of these activities through teaching, publications or knowledge transfer. If the body also carries out economic activities, separate accounts must be kept for the funding, costs and income of these economic activities. Undertakings which may exercise a decisive influence over such an entity, for example as shareholders or members, must not have preferential access to the results obtained.

Knowledge and technology transfer - mutually enriching targeted dissemination of knowledge, skills, know-how and technology from the research organization to the application sphere and vice versa. European definition (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) states that: **"knowledge transfer**" is a process aimed at acquiring, collecting and sharing explicit and tacit knowledge, including skills and competences in economic and non-economic activities such as collaborative research, consultancy, licensing, spin-offs, publications and mobility of researchers and others involved in these activities. In addition to scientific and technical knowledge, it also includes other types of knowledge, such as knowledge relating to the application of standards and the legislation in which these standards are embodied, knowledge of the conditions of the real operating environment and methods of organizational innovation, as well as knowledge management in relation to the identification, acquisition, safeguarding, protection and exploitation of intangible assets. **Commercialization** is then a subset of knowledge and technology transfer leading to market application and subsequent monetization.

Effective collaboration - cooperation between at least two independent parties to exchange knowledge or technology or to achieve a common goal on the basis of a division of labour, where the parties concerned jointly define the scope of the cooperative research project, contribute to its implementation and share its risks and results. The costs of the project may be borne in full by one

or more of the parties, thereby relieving the other parties of their financial risks. Contract research and the provision of research services are not considered forms of cooperation.

Exclusive development - the procurement of research and development services for which all the benefits obtained accrue exclusively to the contracting authority or contracting entities and which may be used by them in the performance of their activities, provided that they pay for the services in full.

Research infrastructure (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) - Facilities, resources and related services used by the scientific community to carry out research in their respective fields, including scientific equipment or toolkits, knowledge-based resources such as collections, archives and structured scientific information, ICT infrastructures such as Grids, computer and software equipment, communication facilities, as well as any other elements of a unique nature that are necessary to carry out research. These infrastructures may be located in one place or may be 'distributed' within a network (organized network of resources)

1.3 Activities of the Technology Transfer Office

The main activities of the Technology Transfer Office include (see Figure 1) above all, the comprehensive protection of intellectual property, which is at the very heart of any such center. This area requires a specialist who oversees the sub-results of the R&D and proactively handles the researchers' searches in the required areas based on the available patent databases, supervises and assists within the set internal system over the entire administrative arrangements for the acceptance of the employees' work. He also monitors and ensures the extension of intellectual property protection through the internal software for this area.

An equally necessary and important activity is the project activity focused on technology transfer. This activity is very crucial for the building and development of the office as such, but also for raising additional funds for scientists and academics, as well as further training of the office staff and the subsequent development of activities and networks not only within the university, within the region, but also at the national or international level.

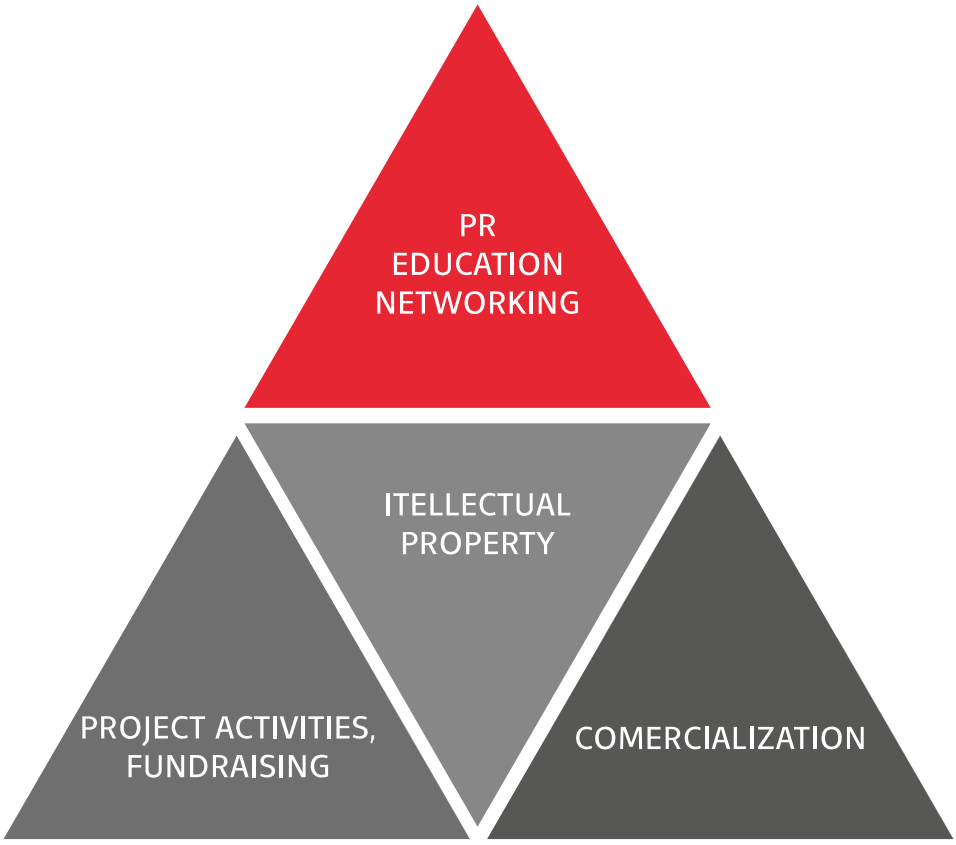


Figure 1 Diagram of the main activities of the Technology Transfer Office

Nowadays any endeavor cannot be imagined without promotion and marketing as well as educational activities towards its mission both towards the inside of the university and towards its surroundings. Related to the educational activities is the anchoring and accreditation of a course on intellectual property protection for Master's and PhD students, which is very important in terms of disseminating knowledge on this important area.

In terms of commercialization and specificity of R&D results, an equally important role of each office is its networking within regional, national and international structures with major innovation players. This role is particularly important in the area of finding commercial entities to which the academic institution's significant R&D results could be offered. Equally, networking is important in terms of engaging and building international databases offering R&D results, sharing industry experiences and examples of good and bad practice and, last but not least, for further gaining experience by enhancing the internal competences of its staff.

Knowledge transfer process

The commercialization process is generally defined as the process of turning an idea into commercial products or services. For most scientific research institutions, this means commercially developing the intellectual property (IP) that has been created as part of the research, with the aim of producing successful commercial outcomes that have a positive impact for wider application in society. This is usually achieved through commercial licensing of intellectual property to an existing business organization or the creation of a new spin-off company to ensure the distribution of new products or services to the market.

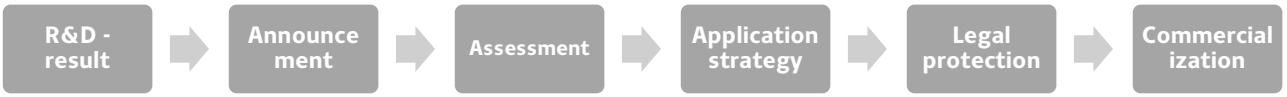


Figure 2 Basic diagram of the technology transfer process

The whole process of protecting the results of industrial property and the subsequent commercial application of scientific knowledge can be divided into several downstream activities, the so-called process. The process starts with the identification of research knowledge that could be used in practice and therefore has the greatest potential to do so. Then, with the help of experts, it is verified whether this knowledge has real commercial potential. This is followed by a decision as to whether the institution, as employer, can exercise the rights to the knowledge or whether these rights can be exercised by the researcher as originator of the knowledge. In the next stage, protection of the industrial property rights is ensured and the appropriate subsequent commercial exploitation is determined. In order to facilitate the transfer of R&D results into practice, specialized offices or departments have been set up at many institutions to deal with this agenda, generally in the form of technology transfer centers, which ensure the step-by-step commercialization process.

The fundamental contribution and grasp of technology transfer processes lies primarily in the setting of transparent rules that will be or are applied internally for scientific/knowledge workers.

An important point or moment within the above mentioned scheme for most R&D results is the further improvement, development and eventual evolution of these results within their own scientific internal, national or international teams. This is another important step that further develops the result (within the internal IP disclosure, national or international team), broadens its application and increases its contribution to society. Again, there is a combination of socialization and subsequent externalization after the tacit knowledge is first externalized.

The area of knowledge transfer or technology transfer can be divided into three key processes:

- Processes related to the care of intellectual property (see chapter 2);
- Process of evaluation and verification of application potential, proof of concept activities (see chapter 3 a 4),
- the process of commercialization towards the application sphere (see chapter 5).

2 Research results as intellectual property

In addition to their core activities, public universities or academic institutions also become a source of information and new knowledge that can be used in the commercial sphere. This knowledge contributes not only to the development of knowledge but also to the development of the social sphere or area. Applied research and development results from commercial entities can also provide funding that will subsequently be used to further the overall development of the institutions concerned.

Thus, the creation of intellectual property is an integral part of scientific work, and by definition, it leads directly to it. The goal of research and development work is the acquisition of new knowledge and skills that can then be demonstrated in many physical (tangible) forms.

A number of laws and international conventions deal with the concept of intellectual property. For example, the Convention establishing the World Intellectual Property Organization (WIPO, 1967) defines intellectual property as rights:

- to literary, artistic and scientific works,
- for performances by performers, sound recordings and radio broadcasts,
- inventions from all fields of human activity,
- on scientific discovery,
- on industrial designs and models,
- to factory, trademark and service marks, as well as to trade names and trade names,
- to protect against unfair competition
- and all other rights relating to intellectual activity in the industrial, scientific, literary and artistic fields.

The different types of results then more or less replicate the individual legal regulations. Their international harmonization is at a very different level and changes dynamically over time. Therefore, when cooperating in an international environment, it is always necessary to check what the current and locally appropriate legislation is and to clarify the mutual understanding with the partner.

Intellectual property rights in the Czech environment can be divided into two main groups (according to the groups of related laws).

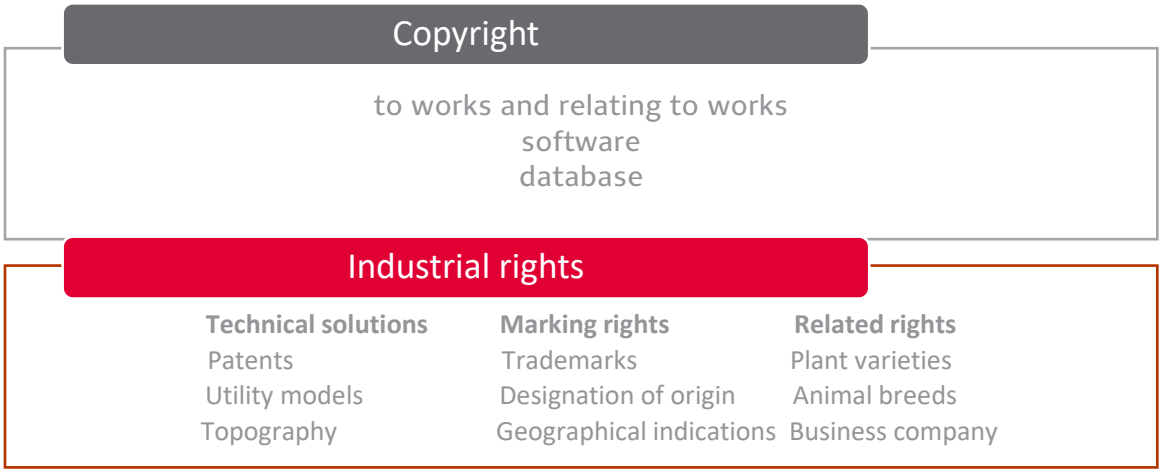


Figure 3 Basic overview of intellectual property rights

Sometimes these two are joined by a group of so-called competition rights, in particular trade secret protection, consumer protection, protection against unfair competition, protection of personality and a number of others.

To work in knowledge and technology transfer (KTT), it is essential to mentally accept that individual rights can work in synergy and complement each other. It is necessary to work with a package of results and rights that we want to transfer with respect and knowledge of the context.

The European Commission in its basic interpretative material (Communication from the Commission - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) states that **intangible assets** are assets that do not have a tangible or financial form, such as patents, licenses, know-how or other types of intellectual property. In addition, **tangible property** is property in the form of land, buildings, plant, machinery and equipment.

ATTENTION! In Czech legislation the definition is different and ambiguous (especially in accounting regulations). It is always necessary to be clear in what context you are talking about property.

2.1 Copyright

It is not the purpose of this chapter to cover the full range of copyright management issues. We will limit ourselves to the direct implications for knowledge and technology transfer. Otherwise, we would be trying to interfere with the craft of lawyers who specialize in copyright law, and that is not really the ambition of the authors of this material. In the field of KTT, however, it is necessary to have a basic understanding of and respect for copyright, which naturally and inseparably accompanies the results of creative activity. Of course, diligent students are fully recommended to self-study the copyright law as it is currently in force (Act No. 121/2000 Coll., Act on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts (Act No. 121/2000 Coll., the Copyright Act, the Act on Rights Related to Copyright and on Amendments to Certain Acts)).

Copyright has deep historical roots, when it primarily served to protect artistic creators, especially literary works. With modern times and the development of thousands of different creative possibilities, copyright has expanded and tried to cover reality, but quite naturally, it has always fallen a little short. The digital world, then, is a chapter of its own, with lawyers arguing and continually debating how it should be done, and the moment they solve one problem, many more emerge. So let's focus on the principles.

What is a work of authorship - let's look directly at the law (Act No. 121/2000 Coll., Act on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts)

§2 Works of authorship

- *The subject matter of copyright is a literary work and other artistic and scientific work which is the unique result of the creative activity of the author and is expressed in any objectively perceptible form, including electronic form, permanently or temporarily, regardless of its scope, purpose or meaning (hereinafter referred to as "work"). In particular, a work is a verbal work expressed in speech or writing, a musical work, a dramatic work and a work of music-drama, a choreographic work and a work of pantomime, a photographic work and a work expressed by a process similar to photography, an audiovisual work such as a cinematographic work, an artistic work such as a work of painting, graphic art and sculpture, an architectural work including a work of urban design, a work of applied art and a cartographic work.*
- *A work is also considered to be a computer program, a photograph and a creation expressed by a process similar to a photograph, which are original in the sense that they are the author's own intellectual creation. A database which is the author's own intellectual creation in the manner of selection or arrangement of its contents and the components of which are systematically or methodically arranged and individually made available electronically or in any other manner is a work in the aggregate. Other criteria for determining the eligibility of a computer program and database for protection shall not apply.*
- *The copyright shall extend to the completed work, its various stages of development and parts, including the title and the names of the characters, provided that they meet the conditions of paragraph 1 or paragraph 2 in the case of the objects of copyright therein.*

- *The subject matter of copyright is also a work created by the creative processing of another work, including the translation of a work into another language. This shall be without prejudice to the right of the author of the processed or translated work.*
- *A collection, such as a magazine, encyclopedia, anthology, tape, exhibition or other collection of independent works or other elements, which, by the manner of selection or arrangement of its contents, satisfies the conditions of paragraph 1, shall be a complete work.*
- *A work under this Act shall not include, in particular, the subject matter of the work per se, a daily report or other data per se, an idea, procedure, principle, method, discovery, scientific theory, mathematical or similar formula, statistical graph or similar subject matter per se.*

§ 3 Exceptions to protection under copyright law in the public interest

Protection under copyright law does not apply to

- *an official work, which is a legal regulation, a decision, a measure of a general nature, a +public document, a publicly accessible register and a collection of its documents, as well as an official draft of an official work and other preparatory official documentation, including an official translation of such a work, parliamentary and senate publications, commemorative books of a municipality (municipal chronicles), a state symbol and a symbol of a unit of local self-government, and other such works for which there is a public interest in excluding them from protection,*
- *creations of traditional folk culture, unless the true name of the author is generally known and the work is anonymous or pseudonymous (§ 7); such work may be used only in a manner that does not diminish its value*.

The basic rule is that copyright applies in principle to anything that has been created by human creativity (some countries also recognize the creativity of animals, especially elephants, and artificial intelligence is widely debated) and has been expressed in an objectively perceptible form that can be evidenced in some way. Whether creative activity was required to produce the result is an absolutely crucial question and can be a matter of dispute - especially when creative authors should be rewarded. Good author recognition is an important part of a transfer agent's job.

There is a relatively simple tool for recognizing creative activity (it's not a panacea, of course), and you will need to use other tools, including cross-examination, to deal with unclear situations. However, as a first criterion, reflection is very often helpful - if someone else was given the same assignment, would they get the same result? And if it were similar, how would it differ?

- *If you are given the task of processing a pile of data into graphs, where part of the assignment is that the graphs should show the time evolution of the observed event and at the same time you know that you have to respect the industry conventions, then your creative activity will be limited to the choice of the colour scale and the placement of the legend. This is not enough to create a work of authorship. Your colleague would obtain very similar graphs by processing the same data.*
- *If your output is a technical documentation that, in addition to the standard parts according to the standards, also contains 3D sections of the apparatus or other visualizations and diagrams, it is likely to be a work of authorship, because your colleague would have drawn it differently (and of course better). But this case is very much on the edge.*
- *And if you have written a part of the analytical report describing what the processed graphs show, which part of the experiment is responsible for it, and if you add recommendations on how not to achieve the effect again, you are a completely unquestionable author.*

There are fields that are very much bound by norms, yet you can find creative activity there. To continue working with the results, it needs to be identified and, if possible, recorded in some way. Later disputes are difficult to resolve. So do the identification of the authors right at the beginning.

Copyright (see above) also includes software, databases and maps - they have slightly specific rules and exceptions, but the general principles are the same.

2.1.1 Basic principles of copyright

The emergence of

Copyright arises automatically when the conditions for the creation of a copyrightable work are fulfilled (see above). It does not have to be declared or registered anywhere. They are valid without almost worldwide enforcement. Note that they apply even to unfinished versions of the resulting work, as long as the version itself fulfils the characteristics of a copyrightable work (which it usually does).

The subject matter of the work itself, the pure idea or motive, is excluded from protection.

- *If you tell someone in a friendly conversation your intention, or the idea you are going to experimentally verify, and that someone then carries out their own verification experiment based on that intention and publishes it before you do, they have not infringed your copyright. He just took advantage of your unreasonable openness.*
- *However, if you send an unfinished article or project proposal to someone for consultation and they publish it or submit it under their own name (even if slightly modified), then they are not only unethical, but also infringing your copyright. A lawsuit is entirely appropriate in this case.*

Duration

Copyright lasts for the lifetime of the author and for 70 years after his death. In the case of co-authored works, 70 years after the death of the last co-author. This period is determined by Czech law. The international convention says that the period should be at least 50 years from the death of the author, some countries give up to 90 years. Therefore, it is necessary to look at the local regulation of the duration of rights. Copyrights are inherited and heirs often enforce them.

- *Try looking at the Golem lawsuits for interest. By the way, how do you picture the Golem? Few people in the Czech Republic are not influenced by his likeness from the movie "The Baker's Emperor". Similarly interesting are the controversies surrounding the Mole, another national treasure.*

Territoriality

In fact, it can be said to apply throughout the civilized world. Copyright is very well harmonized across different systems. The fact that rights are not respected in some parts of the world is a simple fact. Enforcement of rights is a separate chapter.

Duality of copyright

Personality rights, which are inextricably linked to the author, are non-transferable, cannot be waived by the author and cease upon the death of the author. In principle, it is the right to mention or not mention the author's name in connection with the work. There is also the right to preserve the integrity of the work and the right to decide on the disclosure of the work, but this part of the right is usually significantly limited if the author is employed.

Property rights, i.e. the right to use the work, to dispose of it for profit, are transferable rights and in most European countries they automatically pass to the author's employer. In principle, these are options that lead to the property value of the work, the possibility of receiving money for it.

The right to use the work in practice means in particular:

- **the right to reproduce the work** - temporary or permanent reproductions in any form (preparing the material for direct sale, if you could only sell one original it would probably be sad),
- **the right to distribute the original or a reproduction of the work** - making it available in tangible form, copies are sold for further use,
- **the right to lease the original or a copy of the work** - pursuing economic benefit not only through direct sales, but I can also lease them for a fee - think of software licenses that you pay for every year,

- **the right to lend the original or a copy of the work** - as access but for less money and only temporarily. You may still remember video lending libraries, you must know libraries, and rare paintings are lent to galleries,
- **the right to display the original or a reproduction of the work** - this is what galleries live on, in a scientific environment it could be those famous posters hanging on the walls of the workplace,
- **the right to communication of the work to the public** - making it available in an intangible form, here probably meaning mainly radio or television, but actually including the whole digital world. It is working with intangible reproductions.

2.1.2 Software, photos, databases, maps

Copyright also includes rights in special works where the question of creativity may be in dispute. It is important to note that legislation is always somewhat behind the technological world and only belatedly responds to problems that arise in practice. For this reason, it is only subsequently that rights in computer programs have been included among copyright. In the case of computer programs and photographs, it is sufficient if they are original, i.e. the author's own intellectual creation. The rights to computer programs are regulated by the Copyright Act in §65 and §66.

If you rewrite a known algorithm (another author's work) using a known programming language (another author's work, probably by several authors), your code is likely to be quite similar, maybe even the same (depending on complexity), as if written by a fellow programmer in the same language. Thus, the criterion of creativity is not met. Nevertheless, the law views such code as your work of authorship (a literary work).

It's even more interesting with databases. A database can sometimes take on the quality of a work of authorship in that its internal architecture, the way it selects and links content, can be the creative, intellectual creation of the author. Such a database is then seen as a work of authorship (a body of work).

In addition, however, there are the rights of the database provider, regardless of whether the database itself is or is not copyrightable. The Copyright Act deals with this topic in the section TITLE III - Special right of the database provider. In a nutshell, this special right provides an advantage to the person who has made the effort and resources to acquire and make the database available. This right lasts for 15 years from the acquisition or making available of the database, counting anew from each new record. The acquirer of the database can thus decide the conditions under which it will allow the exploitation of its database and can offer different types of licenses to allow users to exploit the data. Again, there are so-called free legal licenses of free use, see chapter 2.1.5.

2.1.3 Employee works

A big issue in research organizations is the fact that the Act introduces the so-called employee works regime. In principle, this means that the exercise of property rights in a copyright work authored by a person in an employment relationship is carried out by the employer. Let's look directly at the law (Act No. 121/2000 Coll., on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts):

§ 58 - Employee work

- *Unless otherwise agreed, the employer shall exercise, in its own name and on its own account, the author's proprietary rights in the work created by the author to fulfil its obligations arising from the employment or service relationship. Such a work is an employee's work. ...*

The law allows both parties to agree otherwise, but this is usually not addressed in employment contracts and is taken as fact. However, for the practice of a transfer agent, this means that if you work with copyright works, you should always check what the relationship is between the author and the institution you work for, and therefore who is entitled to exercise the property rights.

The important factor here is that the author created the work in order to fulfil his or her duties - i.e. on the basis of a job description or work assignment.

You may encounter a situation where a person is employed at a university in an administrative position and their job description does not include scientific, research or other creative activities. This person writes interesting books in his/her spare time (the topic is completely arbitrary) that are commonly sold. The same person is then noticed by the media and perhaps even invited to comment on events on their programmes, or have a documentary made about him or her.

What are all the works this person creates? Who has the rights to them? Can the institution claim anything in this situation?

The fascinating problem you will face is when that same person wants to publish the books in question under your institution's name and using grants that he can apply for as an employee of your institution, and furthermore makes no secret of the fact that he is working on his works during working hours and using other resources such as a computer, an internet connection, an academic library with its subscription access, and whatever else you can think of.

What solution would you suggest for this situation?

You will be in a different situation if you find that an employee of your institution who has research and creative activities in his/her job description is exercising property rights on his/her own and on his/her own account. Typically, this involves entering into licensing agreements with publishers where the agreement specifies the author's personal account for payment of royalties. In the case of a monograph or a textbook, the financial dimension may not be negligible. For software and databases in particular. Beware, there may also be unauthorized transfers of rights under collaboration agreements or grant co-sponsorships.

Find out how your institution works to protect your rights as an employer.

- *Upon the death or termination of the employer who was entitled to exercise the property rights in the employee's work and who has no legal successor, the author becomes entitled to exercise these rights.*

In a research organization, this situation is unlikely to arise, but what you may encounter is the transfer of rights between entities that move between organizations. Recognizing the transfer of rights to a successor in title is then part of the 'who owns the rights' transfer balance sheet.

Beware, however, of a situation where a research group has been dissolved or transferred to another institution and its members, the authors, have thus moved to a new employer. This is not a situation where the original employer has ceased to exist and the original copyright remains with that employer. In order for the members of the research group to continue working on their original works, they need permission from the original employer to do so. In practice, however, this is usually not thought of and no one is too concerned. Beware, however, in cases where the work might have commercial potential. Then the situation needs to be resolved - ideally by agreement between the two entities.

- *If the employer does not exercise the proprietary rights in the employee's work at all or exercises them insufficiently, the author has the right to demand that the employer grant him a license on normal terms, unless there is a compelling reason on the part of the employer to refuse.*

It is the responsibility of the research organization to properly manage its assets and therefore to properly exercise its property rights over the employees' works. How this exercise of rights occurs in practice I leave to each reader as part of the homework and analytical work on his or her own institution. The preparation of this analysis should be part of the preparation for the work of a transfer agent, and although copyright works are often underestimated in terms of their potential for commercialization, remember that copyright works also include software, databases, but also monographs and textbooks, which are often very interesting market commodities, and in the arts, for example, graphics and design, which are directly intended for commercialization.

- *The author's personality rights in the employee's work remain unaffected. If the employer exercises proprietary rights in the employee's work, the author shall be deemed to have consented to the publication, modification, processing, including translation, combination with another work, inclusion in a collective work, as well as to the public performance of the employee's work under his or her name, unless otherwise agreed.*

- *Unless otherwise agreed, the author shall be deemed to have given permission to the employer to complete his unfinished employee work in the event that his legal relationship with the employer ends before he completes the work and in the event that there are reasonable grounds for concern that the employee will not complete the work properly or in a timely manner consistent with the employer's needs.*

Again, the fact that it may have been agreed otherwise is important - and it is for you, as the transferor, to check whether or not otherwise was agreed in the case of a particular work. This does not happen in the usual practice of research organizations, but the devil never sleeps. Because if it has been negotiated otherwise, it can mean problems not only for future transfers, but also for the research group itself and for further work with the results of the work of the author who has negotiated otherwise. However, at the time this paper was written, the authors had not heard of any dispute that addressed these two paragraphs.

- *Unless otherwise agreed, the author of an employee's work shall be entitled to reasonable additional remuneration against the employer if the wages or other remuneration paid to the author by the employer is manifestly disproportionate to the profit derived from the exploitation of the rights in the employee's work and the importance of such work in the achievement of such profit; this provision shall not apply to the works referred to in paragraph 7, whether or not they are employee's works or are deemed to be such works, unless otherwise agreed.*
- *Computer programs and databases, as well as cartographic works that are not collective works, shall be deemed to be works of an employee even if they have been created by the author on commission; in such a case, the commissioning party shall be deemed to be the employer. Section 61 shall not apply to such works.*
- *The rights and obligations under paragraphs 1 to 6 shall remain unaffected by the termination of the legal relationship under paragraph 1 or, where applicable, paragraph 7.*

Extremely important sections of the Act to bear in mind, and we will return to them in the subchapter 2.1.6 Remuneration of authors.

In the context of the subsection on employee works, it is necessary to mention one more phenomenon of the Czech research environment, which the profession of a transfer agent faces. In addition to the Copyright Act, from which the previous information is taken, the relationship between the employee and the employer is also regulated by Act No. 262/2006, the Labour Code. Section 304 thereof states that in order for employees to engage in other gainful activities in addition to their employment that are **identical to the employer's business**, they need the employer's prior written consent. However, this restriction does not apply to the performance of scientific, pedagogical, journalistic, literary and artistic activities. The legislator clearly intended to allow creative personalities to work in more than one field. Thus, it happens that scientists have a full-time job in a research institution and simultaneously teach at a school or university and, in addition, write a monograph on their field at home, without this being in the job description of any of their employers. Such a situation is fully in line with the law.

Note, however, that the fact that he does not need the employer's consent to do so does not mean that he can deny the employer the exercise of property rights in works that are in the employee works regime.

At the same time, Section 301 of the same Act imposes a duty on employees to properly protect the employer's property and not to act contrary to the employer's legitimate interests.

There are known cases where a researcher produces an interesting result within a project and, because he or she feels that the research organization would not be able to use it properly, hands it over to a partner company (often his or her own) for use without the knowledge of the institution. In doing so, he refers to Section 304 of the Labour Code.

Such behaviour is not only unethical, but downright illegal, and the damage it causes to the research organization probably exceeds the threshold for criminal classification. f such behavior is discovered, it is necessary to initiate the enforcement of the employer's rights, including the payment of lost profit (the usual rate is twice the license fee) and compensation for damages. The

need to draw consequences against the person of the infringer in employment law terms is probably unnecessary to discuss. What would you suggest as a solution in such a case if you were in the position of a statutory representative of the institution?

Sometimes it also happens that an employee does not have creative activities in his/her job description, but still performs them. This is analogous to the example in the previous sections. Is it an employee's work? Who is entitled to what?

The authors of the Copyright Act have hidden an interesting situation for transferors in §58, paragraph 7, which says specifically for computer programs, databases and maps that if the author creates them on commission, the commissioning party does not obtain a license, but is in the position of an employer and therefore exercises complete property rights. The snag is that the order must go directly to the author, probably in the position of a sole trader (self-employed, natural person). If we order the creation of the software or map from a company (e.g. Ltd.), then the company is the employer and we purchase the license from them as the one who exercises the author's property rights.

2.1.4 School works

Specific situations arise when the authors are students. The extreme claim by some professors that a student can never create anything must be categorically rejected. Creativity is not determined by education or the wisdom of age; creativity and works of authorship can be produced from early childhood and copyright belongs to them as fully as to the works of more mature and educated individuals.

Students do not usually have an employment relationship with their school. In some cases, however, they are, and then they are covered by the regime in the previous subchapter. The Copyright Act specifically regulates the rights in works of students who are not also employees of the school. Let us look again at how and what is written in this context (Act No. 121/2000 Coll., on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts)

§ 60 – Schoolwork

- *The school or educational establishment has the right to enter into a license agreement for the use of the school's work under normal conditions (Section 35(3)). If the author of such a work refuses to grant permission without good reason, these persons may seek to replace the lack of his or her consent in court. Section 35(3) remains unaffected.*

It is clear from the introduction that in the case of a student who has created a work, there is no automatic transfer of rights, but the student has all the rights. Regardless of whether or not the creation of the work was assigned to him as a task to fulfil his study obligations. It does not matter whether it is a bachelor's, master's or doctoral thesis, or perhaps the result of a semester project. The property rights belong to the student.

The school may require the license to be entered into on normal terms and conditions, i.e. usually not for free. However, this can be negotiated, especially if the works are of a scientific or research type that the research group would like to continue to work with. In such cases, however, it is advisable to employ the student for this type of work and thus avoid the complexity of negotiating a license.

- *Unless otherwise agreed, the author of a school work may use or license his/her work to another, provided that this does not conflict with the legitimate interests of the school or school or educational institution.*

What might be the legitimate interests of the school? What about the research already outlined above and the work of the research group of which the student was a part? It's a bit of a conspiracy theory, but it's conceivable a situation where a student disagrees with his own research group and "sells" his portion of the work to which he is entitled to all rights to a competing group. It may also be part of his/her transition to another research position, where he/she brings with him/her valuable results of his/her previous work.

- Attention should be paid to school works, especially where they deal with so-called applied arts - furniture design, clothing and footwear, fashion accessories, graphics, audiovisual effects and similar matters, which can then be very good business.

Perhaps the kind reader can think of other examples, then I ask them to share their ideas with their fellow transfer agents to increase general awareness of the risks involved.

- *The school or educational establishment shall be entitled to demand that the author of the school work make a reasonable contribution from the profit made by the author in connection with the use of the work or the granting of a license pursuant to paragraph 2 to the costs incurred by the author in creating the work, as the case may be, up to the actual amount thereof, taking into account the amount of the profit made by the school or educational establishment from the use of the school work pursuant to paragraph 1.*

There are a number of known cases where students have created very interesting and commercially successful works. Their use is in the student's hands, or the profit from the use of the work is realized under a license to a third party. There are even known cases where a huge international business has been built on the basis of school work. According to the wording of the law, the school is entitled to demand, the question is whether it will demand and how they will finally agree. Perhaps it would be better for the school to warm up a bit in the light of success and use it for its promotion rather than reimbursement of costs. The specific procedure will depend a lot on the specific subject of the rights and many other contexts.

2.1.5 Use of the copyrighted work by another user

In principle, copyright restricts other users from what they can do with someone else's work. However, it is necessary to keep in mind the fact that the fact that someone should not do something does not mean that he does not do it. As in other parts of the law, where there is no prosecutor, there is no judge. Copyright must also be enforced. It is true, however, that copyright protection has improved considerably with the development of the Internet, and thanks to media scandals, awareness of copyright in society has also strengthened a lot. Let's take a look at how to do it so that someone else can legally use your works = what is or can be subject to knowledge transfer.

Property rights allow other users to be granted **consent or licenses** in a very wide range of options. The license may be territorially and temporally limited, it may only define some of the activities that the licensee can do with the work. Remuneration for the use of the work is a standard part of the license agreement.

- *Commonly concluded publishing contracts are license agreements. They should be concluded only by the statutory representative of the institution or by staff authorized by him. Contracts concluded by employees of a research organization without the consent of the statutory body are invalid in principle.*

Creative Commons and FOSS

To facilitate work with licenses, a system of so-called "license work" was created. Creative commons, which are in principle pre-prepared license agreements and as a kit you can set up rules for foreign users that you want to be respected. They can be used for virtually all author's works, in the case of computer programs there is a system called FOSS (Free and open-source software), which is much more sophisticated and there are countless variants of accessibility.(Creative Commons, nedatováno)

Creative Commons is a tool for the legal implementation of Open Science. By marking the work or publishing it under the selected CC license, you offer a royalty-free license to an indeterminate circle of people for the entire duration of the protection of the work. This license can be obtained implicitly, i.e. by accepting the offered license. For easy orientation in the offered scope of the license, there is a system of pictograms and abbreviations that are commonly used. The full text of the license terms is also available in Czech at the CC – Creative Commons Czech Republic License website. There are a number of explanatory

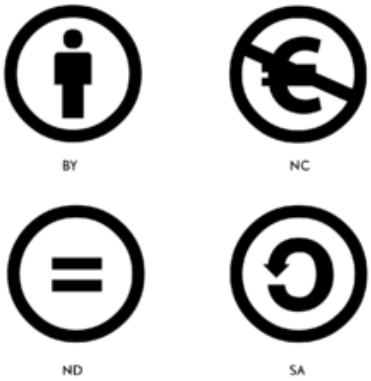
sites, so here only very briefly, what are the basic elements from which it is possible to build a license:

BY - please indicate the author and origin of the work. You may use the work, but please acknowledge it and credit us.

NC - for non-commercial use only. So if you want to use the work for business, please get in touch and we'll make arrangements.

ND - preserve the original form of the work. You may use it, you may copy it, but you may not modify it in any way. And if you need to modify it, contact us, we will arrange it.

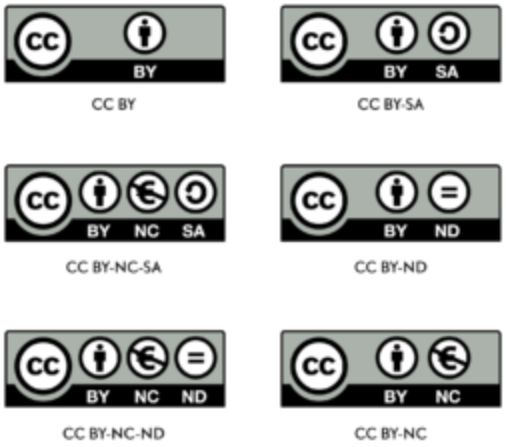
SA - you can modify the work, you can make it new and your own, but you have to redistribute the new work under the same license. So it acts a bit like a virus. Beware if your work is infected in this way.



The licenses composed of these cornerstones have different levels of openness.

CC BY - the license allows anyone to use the work in any way, for any purpose, without restriction, worldwide and free of charge, for a single consideration - the author or rights holder must be credited. If you re-create the work and distribute this new work, you should credit the original author and the original license.

CC BY-SA - you may use the work however you wish, but you will make any derivative work available under the same license (or a more recent analogous license). And be sure to credit the author. If you would like to adapt the work and use it for a new business, don't use one that is freely downloadable under that license, but contact the author or rights holder and ask for a different type of license.



CC BY-ND - You may use and redistribute the work, but only in its original form. You may not modify or alter it. And don't forget to credit the author. If you want to use the work for a collective edition or adapt it for another form, contact the rights holder and ask for a different type of license.

CC BY-NC - In this case we reserve the prohibition of commercial use. So feel free to download the work, modify it as you like and use it, but only if you don't want to make a profit. This license seems like a good addition for cases where there is commercial potential for use of the work, but at the same time it would benefit from getting it out to the public. Oh, and don't forget to credit the author. The very next license is even more appropriate for this:

CC BY-NC-SA - the most favourable open license for transferors, combining non-commercial use and license maintenance. This license is used a lot, for example by MIT (Massachusetts Institute of Technology). In terms of repetition, it means that anyone can adapt and use the work, but only for non-commercial purposes and with attribution, but any derivative work will be encumbered by the same license or a newer version of it. This means that even derivative works cannot be used for commercial purposes. Again, this means that if someone wants to use it for commercial purposes, they should contact you and I'm sure you can work something out.

CC BY-NC-ND - the most restrictive open license, which does not allow modification of the work or commercial use. So anyone can download the work and redistribute it in an exact copy, and can even use it, but only for non-commercial purposes, and they still have to credit the author. And yet it's still an open license.

Some funders require you to publish the results of your projects under the recommended CC license. In recent years, there has also been increasing pressure for so-called Open Science, especially in publicly funded research. In terms of knowledge transfer and proper asset management, context and application potential should always be considered. Be careful to always check well what a given choice of open license means and, where appropriate, justify why this cannot be done with a view to properly exploiting the application potential of the result.

Open licensing is a full-fledged knowledge transfer tool when it makes sense. But the rule of the whole Open Science movement must be respected:

"Open as possible, close as necessary"

In the case of software, there are many more similar licenses. It is necessary to be cautious when transferring.

It happens that you find that a promising application result contains software that is built from components encumbered by FOSS licenses. Even worse, the code of your software is itself published under a FOSS license, at worst for unrestricted use. At that point, as a transfer agent, you feel like throwing it away, preferably with your hands and a competent scientist.

How to proceed when you have software as part of the result with commercial potential?

1) Verify that it is not infected with a FOSS license, and if so, which one.
2) Consider the extent of the infection and compare it to the application potential.
3) Decide on the next course of action:
    a. only if it makes very good sense - have the relevant parts reprogrammed,
    b. change or adjust the commercialization strategy,
    c. evaluate it as a nice teaching case and don't give it any more energy.

Work to order

In this section, we're already looking a bit under the hood of the transfer strategy for a particular result, but since copyright law clearly tells us what happens when someone commissions a work from us, let's include that in this section as well.

§ 61 - Commissioned work and competition work (Act No. 121/2000 Coll., Act on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts)

If the work is created by the author on the basis of a work contract (work made for hire), the author is deemed to have granted a license for the purpose of the contract, unless otherwise agreed. The client is only entitled to use the work beyond such purpose on the basis of a license agreement, unless otherwise provided for in this Act.

This provision is also reflected in the Civil Code (Act No. 89/2012 Coll., the Civil Code), where contractual types are specified. From the wording of this paragraph, it is clear that even if you conclude a Work Contract, you are effectively concluding a licensing contract, which is a transfer of knowledge. It is then a good idea to specify the scope of the license in such a contract. Importantly, in this case the **research organization** remains the **owner of the work!** If the client would like to become the owner of the work, and therefore of all its rights, then this needs to be explicitly stated and also properly priced, remembering that the author's rights remain with the author. The new owner thus assumes the legal obligation to pay the authors additional remuneration in connection with the use of the work.

Unless otherwise agreed, the author may use and license the work created for the order to another, provided that this does not conflict with the legitimate interests of the client.

Fascinating stuff, but logical and more than desirable in a scientific environment. Imagine a situation where you were not allowed to use the knowledge gained from one order in your research. That wouldn't make sense, would it.

- *A common situation in the creative industries - you go to an architect and have him design your dream house. You have it built according to his design, but the rights to the design belong to him. So it could be that someone else comes along and wants a very similar house. The architect will then, quite legally, take the original design and either sell it (or license its condition) to the next person or slightly modify it and license the new work. Unless you have expressly forbidden him to do so in the contract, he is perfectly free to do so.*
- *The situation in the research environment - it may happen that you create something tailor-made for a specific company. It's competitively important to them and they may ask the research organization not to talk about it anywhere, and most importantly not to show it to anyone else and not to put it in the hands of competitors in particular. As a research organization, you can agree to such terms, but BEWARE, this is a reason to ask for a significantly higher consideration for fulfilling such an order, which will severely limit you from doing further work.*

Very similar provisions can be found in the Copyright Act in other places, for example:

- A collective work, if part of it is made on commission, is considered to be an employee work.
- Computer program, database and map, if implemented on order (from an individual) then it is viewed as employee. In this case, however, beware, when you order these works from a company or other institution, then you are only getting a license to use as ordered, not the entire property rights.

Free use and legal licenses

The law directly lists the possibilities when a user can use copyright without consent or without a license. These are rather marginal in transfer practice, but it is good to know about them.

Examples include:

- Record, reproduction or imitation for personal non-commercial use

- *Each of us can make a copy of the film on our own backup external drive for when we need to watch the film on a computer without a drive. Or I can make a copy of the picture for my own collection catalogue.*

- Citations: (a) literary, (b) critical, and (c) "for illustration" in non-economic research or education

- *All scientists know this and make good use of it. However, beware of the limit of tolerability and the difference between citation and plagiarism. Beware of copying textbooks and scripts even for teaching purposes. If they are normally available (albeit at an ungodly price), it is ethical and legally correct for students to get their own copy or borrow one from the library. Copying an entire textbook sequentially spread out over a semester's instruction is not right; it is an illegal act. Education can be part of knowledge transfer activities - be careful to respect others' copyrights.*

- Official and intelligence license

- *In this case, you may also recall recent media cases where the "appropriateness" of the use of photographs was addressed. The GDPR phenomenon also works with this type of license. Given the scope and purpose of this material here, let's just note that you need a really strong reason for this type of use, and it can still be time limited. For transfer, this type of license is not really suitable, but you can seek restrictions if someone else tries to hack into your institution's rights through them.*

- Library license - makes and makes available originals or copies and pays a fee for this

- *Discuss this topic further with your institution's library. The Library Act goes far beyond the purpose of this material*.

2.1.6 Remuneration of authors

In principle, authors are entitled to remuneration for the use of their work. Whole professions are based on authors' remuneration - programmers, graphic designers, filmmakers, musicians, artists, architects and designers; people who make a living by creating works of authorship and allowing them to be used for remuneration. The complexity of the subject is far beyond the scope of this material. For the purposes of knowledge and technology transfer in the research environment, we will limit ourselves to a few basic facts and only in the context of employee works. We start from the assumption that if the works are not employee copyright works, then the author is responsible for their use and remuneration (or uses a collective manager to do so).

In the case of employee works, generally:

- It is considered that the remuneration for the creation of the work is already part of the wages. Creativity is part of the job and the remuneration should reflect this. However, it may be contractually regulated otherwise. And, of course, the employer may use the additional remuneration as an incentive and expression of appreciation.
- The law gives authors the right to a **reasonable additional remuneration if the** remuneration already paid to the author becomes manifestly disproportionate to the profit from the exploitation of the rights. Research institutions should have set internal rules, sufficiently incentive-based, which set out how royalties from copyright works will be paid. Especially in the field of software and databases, but sometimes even for monographs, the sums involved can be considerable. This remuneration may be waived by the employee contractually. This provision does not apply to computer programs, databases and maps - in these cases, significant financial value is expected and as such they are directly created.
- Importantly, the right to additional remuneration continues after the end of the employment relationship and is inherited.

It is therefore highly recommended that a contract be concluded between the authors and the institution to regulate the mutual relations and obligations. This contract should be an essential element in the event of termination of employment. The fulfilment of such a contract obviously presupposes the proper management of the authors' works and the processes set up to identify and record the costs and revenues related to the use of the work and the subsequent payment of remuneration to the authors.

The method of payment is the subject of intense legal debate - it is debated whether it is income from dependent or independent activity, whether it is part of wages, and which deductions it is subject to. I recommend discussing this topic with the institution's payroll accountant.

2.2 Industrial rights

The main and fundamental difference between intellectual property falling within the copyright area and the industrial law area is that for rights falling within the copyright area there is no need to register it with the locally competent industrial property office, whereas for rights falling within the industrial law area there is a need to register it with the competent industrial property office. Unlike copyright, an industrial right is created only if the originator or applicant performs the formal act of filing an application or request and pays administrative fees.

The basic effect of registered industrial property is that no one else may use it without the consent of its owner. The right obtained is valid only in the territory for which it was granted. This principle is called the principle of territoriality. The term of protection is limited and the owner of the right must pay maintenance or renewal fees to keep it valid.

Consent to use the patent is granted by a so-called license agreement. In the event of infringement of industrial law rights, full civil and criminal liability is established.

2.2.1 Patents / inventions

A patent is the best known industrial right that is also used in research practice to assess the quality of research, not always happily, it should be noted. A patent is a monopoly right and is thus, in principle, intended for inventions that are intended to be traded or otherwise marketed. A patent

has sharply defined limits to its scope and is often the subject of disputes and cross-definition. Obtaining a patent merely as a monitoring indicator is a waste of money and human time.

The rules for the protection of inventions by patent specify (Act No. 527/1990 Coll. on Inventions, Industrial Designs and Improvements).

After a positive procedure, a patent is granted for such innovations or inventions that meet three insurmountable legal conditions, which are:

- new, (on the date of filing the application with the patent office, the invention must not have been published in any way, by anyone, anywhere in the world)
- the result of inventive activity (an invention is the result of inventive activity that does not follow in an obvious way to the average person skilled in the art from known facts, i.e. from any information that is in the world)
- industrially exploitable (it must be clear how the new invention can be used in industry).

Patent protection is available not only for new products and technologies, but also for chemically produced substances, pharmaceuticals, industrial production microorganisms, as well as biotechnological processes and products obtained by means of them. Excluded from patent protection are discoveries or scientific theories, computer programs, new plant varieties and animal breeds, and methods of treating humans and animals.

The term of registered patent protection lasts for 20 years and must be renewed continuously after the expiry of one year. A more detailed description of the patent procedure, including the international phase, is described in the chapter 4.1.

An important characteristic of a patent is that its content and scope is very carefully examined during the grant procedure. Obtaining a patent (let's talk only about marketable patents) is not entirely easy and if you obtain one in a given territory, it can be assumed that the acquisition itself is of significant value to a possible future licensee.

Logging in abroad

Patent proceedings in different countries are similar to the system in the Czech Republic. The proceedings in individual countries or regions (for joint regional patents) are independent of each other. The applicant has a 12-month priority right from the priority date to file the invention in any country of the Paris EU Convention (i.e. almost anywhere in the world). During this year, by approaching potential commercial partners, he/she will get an idea of which territories he/she will or will not want to enter with the invention.

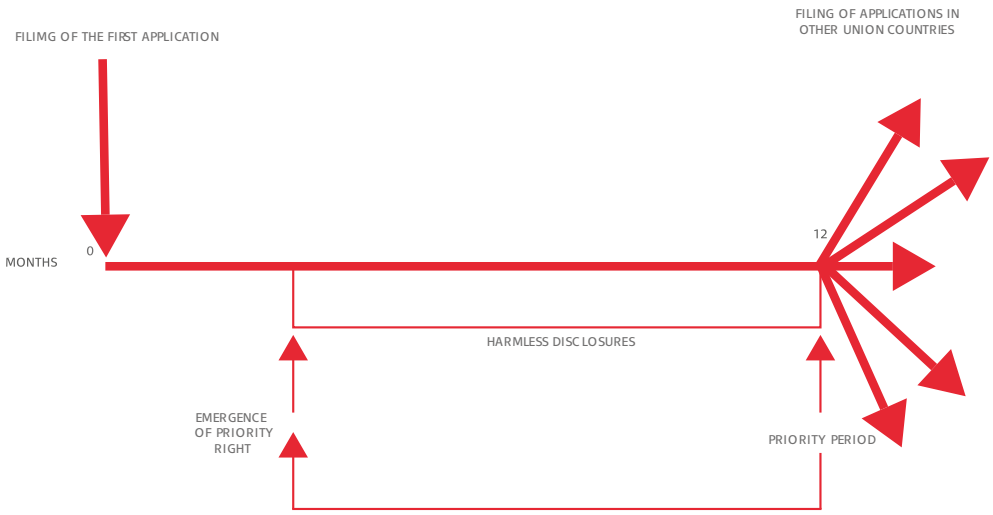


Figure 4 First stage of the patent application procedure

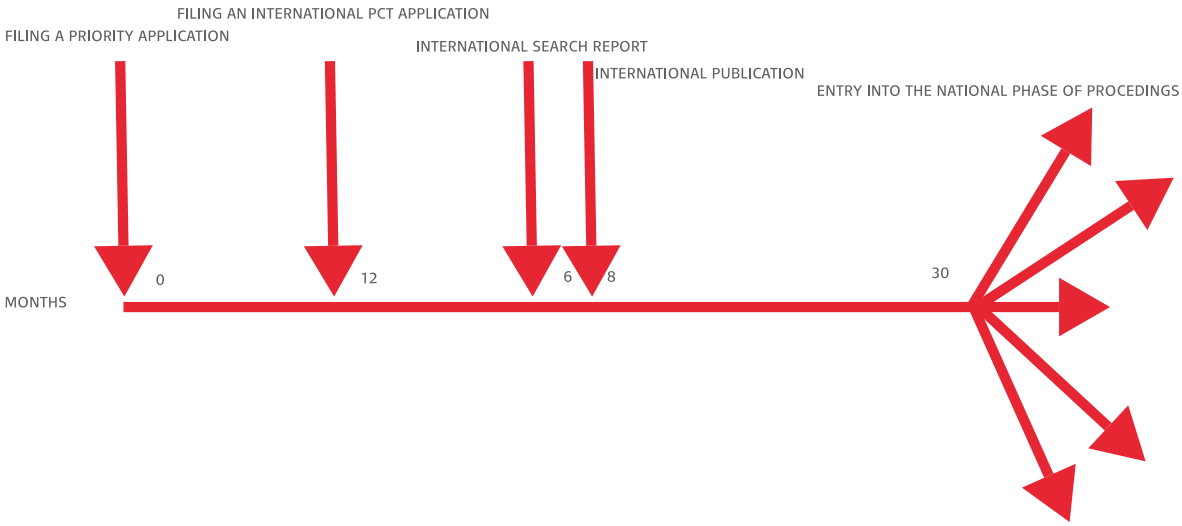


Figure 5 Timeline of international proceedings using priority from the first application filed

The market value of a patent declines sharply over time; once it is published, it is assumed that if it protects something of market interest, it motivates competitors to find alternatives, technology develops, and the time for monopoly is shortened. For example, in the case of pharmaceuticals, there are companies that specialize in so-called generics - they have production ready and as soon as the patent falls they flood the market with them.

2.2.2 Utility Model

Industrial law determines in our country (Act No. 478/1992 Coll. on utility models).

A utility model may protect innovations and results that meet the following non-negotiable conditions: technical solution:

- is new,
- is industrially exploitable and at the same time,
- goes beyond mere professional skills.

However, all methods of production or work activities and biological reproductive materials are excluded from utility model protection. The maximum period of utility model protection is possible for a period of 10 years and is extended in the following time periods is 4+3+3.

The utility model is entered in the register without a full examination, the registration period is approximately 3 months, during which only the formalities of the application are examined. Obtaining a registered utility model is thus very easy, quick and cheap, unfortunately the legal protection is weak in view of this fact. In cases where there is a time crunch and it is necessary to obtain at least provisional legal protection quickly, the simultaneous filing of a patent application and a utility model is used. However, this quite rational practice subsequently causes chaos in the evaluation methodologies.

Beware of confusion with industrial design.

Logging in abroad

Not all states that are part of international conventions know the institution of utility model. If it is desirable to extend the validity of legal protection abroad, it is necessary to check under which regime a particular country or region allows it. It is possible to claim priority from a utility model in the same way as from a patent and to extend and strengthen the legal protection by a patent with all the requisites that go with it. The question to consider will be the quality and scope of the original utility model.

Difference PATENT x UTILITY MODEL

- Proceeding for an invention and thus obtaining a patent is more time-consuming than the utility model procedure itself, which is based on the registration principle. (in the order of months).
- The administrative fees for utility model protection are lower than those for invention protection.
- The two industrial rights differ in the actual length of protection. The maximum duration of a utility model, subject to payment of renewal fees, is half that of a patent, i.e. 10 years in total. Maintenance fees for a patent are usually paid annually, while a utility model is renewed after longer periods.
- In terms of eligibility for protection, neither methods of production nor work activities can be protected through a utility model (but they can be protected through a patent)
- From a formal point of view, an annotation is required for a patent, but not for a utility model application.
- In terms of protection against third parties, this is effective for a patent from the publication of the application, but damages are enforceable only after the patent is granted. In the case of a utility model, the protection is effective and thus the damage is enforceable from the date of registration in the Register of Utility Models.
- Far from all countries work with the institute of utility model, the international environment is not harmonized, unlike the patent.

2.2.3 Industrial design

The method of protection by industrial design is regulated in our country (Act No. 207/2000 Coll. on the Protection of Industrial Designs). This Act simultaneously repealed the corresponding part of the Patent Act (Act No. 527/1990 Coll. on Inventions, Industrial Designs and Improvements), but industrial designs remained in its title.

Design protection is intended for design solutions. Industrial design means the protection of the appearance of a product (external design), consisting in particular in the markings of lines, contours, colours, shape, structure or materials of the product itself, or its decoration, but not its technical or structural function. It is the result of creative artistic activity.

In order to be registered, a design must meet the following criteria:

- be new,
- have an individual character, i.e. give a different overall impression from the already known industrial designs.

An industrial design may not be registered for the appearance of a product which is contrary to the principles of public policy or good morals.

The total term of protection for the ongoing payment of administrative fees is 25 years, payable in increments over a five-year cycle.

Design protection makes sense wherever the appearance of the product is decisive or decisive. It can be in parallel with other rights.

2.2.4 Trademark

The trademark phenomenon can play a very interesting role in the research environment. For legal regulations, see (Act No. 441/2003 Coll., on Trademarks).

A trade mark may protect any sign consisting in particular of words, including personal names, colour, drawing, letters, numerals or the shape of a product or its packaging or sounds, provided that it is capable of distinguishing the goods or services of one person from those of another and is capable of being expressed in the trade mark register in a manner which enables the competent authorities and the public to determine clearly and precisely the subject-matter of the protection

afforded to the proprietor of the trade mark. This characteristic is referred to as distinctiveness and is a key factor in the enforcement of rights.

It is also important when dealing with trademarks to list the goods and services to which the right applies.

By entering the mark in the register, the owner of the mark acquires the exclusive right to use it. The validity of the trademark is 10 years from the date of filing the trademark application. The validity itself may be extended indefinitely for a further 10 years on the basis of an application for renewal of the trademark filed within the statutory period.

Possible types of trademarks:

- **Word trademark** - protects and restricts the use of a word (name) in any shape or form. It is the broadest form of protection. In this case, commonly used words or phrases cannot be protected; distinctiveness is the most important consideration here.
- **Figurative trademark** - protects and restricts the specific form and design of a mark, typically a logo. It can thus be applied, for example, to commonly used words that cannot be protected by a word mark.
- **Spatial trademark** - very often applied for in parallel with an industrial design. A typical spatial trademark is the traditional Coca-Cola bottle.
- **Positional trademark** - used when it is important for the recognition of your brand where the recognition element is located. Skechers, for example, holds a positional mark to protect the placement of the wave on the side of the sole of its shoes.
- **With pattern** - usually in combination with an industrial pattern, often in the fashion industry. Try to remember what Louis Vuitton handbags look like.
- **Colour** - this can be one particular colour or a characteristic combination of colours, for example the magenta colour used by T-mobile or the grey-bronze combination used by Duracell.
- **Audio** - typically various jingles for example of radio programmes, at one time Nokia used to have audio trademarks for ringtones.
- **Multimedia** - you will think of the characteristic opening parts of films produced by major film studios, which are made up of image and sound together. The opening sequence of James Bond films is also protected by the trademark.
- **Hologram** - technologically relatively new, in principle it is a picture stamp, but in a hologram design that adds additional parameters to the image. It can also be a surface treatment of a part of a product (so not necessarily an image), and the colours can vary with different viewing angles or tilt.
- **Motion** - usually recorded by video or animation, it characterizes the way the logo is unfolded or drawn in sequence, some motion artists use it to protect their own figures.
- Other

The proprietor of a trademark has a duty to take care to preserve its distinctive character. This means that he must monitor its use and enforce his rights to prevent, for example, its dehumanization. Competitors can also challenge a trademark that has not been used for more than five years. The burden of proving its use is then on the right holder and if he fails to prove its use, the right may be revoked.

The trademark proprietor is also obliged to monitor newly filed trademarks in its territory for infringement of its rights. If he allows a competing mark to be registered that is confusing, then he may get into trouble.

When used correctly, the value of a trademark grows over time and can take on enormous proportions. A significant part of our market civilization is based on "brands".

Since 2019, it is also possible to register a so-called non-traditional trademark in the Czech Republic. It is therefore currently possible to register any sign that is eligible to be expressed in the trademark register maintained at the UPV. In other words, it is a representation that is capable of being expressed by equivalent technical means. Another novelty in the field of trademarks is the possibility to file a so-called certification trademark following the European regulation. This trademark is capable of distinguishing products or services which have been certified by the proprietor of the trademark for material, method of manufacture of products or provision of services, quality, accuracy or other characteristics from products or services which are not so certified and thus guarantees to the consumer specific characteristics and services for products, goods, services or other services. The only limitation within this area is the so-called neutrality limitation, which specifies that one cannot personally CERTIFY products or services. Anyone who is eligible to certify the products or services for which the certification mark is to be registered and is not engaged in a business activity involving the supply of products or services that are certified may apply for registration of a certification mark. The application for a certification mark shall be accompanied by the rules for the use of the certification mark.

A certain novelty is also a collective trademark for which a legal entity, in particular an association of producers, manufacturers, service providers or traders with legal personality and legal entities under public law, may apply for registration. It should be noted that a collective trademark cannot be licensed, can be transferred and can also be discontinued.

METHOD OF TRADEMARK PROCEEDINGS

The applicant duly completes the application (electronically or physically), duly submits all the necessary attachments and a representation of the trademark and pays the administrative fee within one month of filing the application for registration of the trademark. An important attachment is the list of goods and services for which the application is filed, according to which they are classified in the International Classification System for Goods and Services. The applicant is obliged to define with sufficient clarity and precision, precisely so that the competent authorities and persons concerned are able to determine the scope of the protection sought on the basis of that definition. In this context, general terms contained in the class headings of the international classifications or other general terms may be used, provided that they meet the required criteria of clarity and precision. Where the applicant applies for registration for goods or services falling into more than one class, he shall group the goods or services according to the international classification system and indicate the class number before each class and arrange the classes in ascending order. Products and services shall not be considered similar merely because they are in the same class according to the International Classification. Goods and services shall not be considered different merely because they are in different classes of the international classification.

After filing or simultaneously with the filing of the trademark, the administrative fee related to this act must be paid before the office. If the fee is not paid by the due date, the application for revocation or invalidation of the trademark shall be deemed not to have been filed.

From the point of view of the modification of the application, the applicant is entitled to divide the application for several goods and services until the registration of the trademark in the Register. The right of priority of the original application shall be maintained even for divisional applications if they contain only the goods or services listed in the original application.

The complete application, including the annexes, is first submitted to an administrative compliance check, where it is checked and ascertained whether the goods and services to be applied for correspond to the Nice Classification and whether the application formally meets all the necessary requirements, e.g. determination of the type of trade mark, orientation of the sign itself, information on the identity of the representative or proof of representation or claim of international priority. It has been newly established under the amended law that the submission of a sample of a product is not a representation of a trademark. If the trademark application filed contains any deficiencies, the applicant is requested to correct them within a specified period of time, which must be at least 2 months. If the applicant fails to remedy the alleged defects or objections concerning only certain goods or services, the Office shall refuse the application to the extent of

those goods or services. If the Office finds that there are facts which prevent the proper examination of the application, the Office shall refuse further proceedings.

After checking the formalities and correcting them, if necessary, the Office will subject the application to a so-called substantive examination. As part of this examination, the application is checked to see whether it meets the eligibility for registration under the Act. In the event of any ambiguities, the applicant is invited to clarify them or, if necessary, to modify the classes claimed for the dedicated goods and services.

Prior to 2019, the Office also examined, as part of the substantive examination, whether the trademark proposal contained identical elements with an earlier registered trademark for similar goods or services. According to the new legislation, since January 2019, the control is up to the applicants or owners of the earlier trademarks. The Office does not have a statutory time limit for substantive examination of the application itself.

After successful formal and substantive examination, the Office publishes the trademark application in the Gazette. This step concludes the third stage of the trademark application procedure.

Objections and comments

After publication of the trademark application in the Gazette, the general public is given the opportunity to comment, in particular on the exclusive rights claimed in the registration process. It should be borne in mind that the institution of comments allows a third party to comment or make a suggestion, but that third party does not become a party to the proceedings. The Office may consider such comments and take them into account in its further decision on the registration of the trademark. The possibility of making submissions is provided for until the registration of the trademark.

The situation is completely different under the institution of objections. These can only be submitted by the persons specified by law, within the statutory period of 3 months. That period runs from the publication of the application. Moreover, the filing of the opposition itself is subject to a fee.

Depending on the result of the above formal and substantive examination and taking into account any comments or objections raised, the trademark is either granted or not granted, with the applicant being informed of this decision subsequently by means of the trademark registration certificate issued.

The registration of a trademark is clearly constitutive. By this act, the applicant himself becomes the owner of the trademark applied for.

After the expiration of the validity period, it is up to the owner whether to reapply for renewal of the trademark registration. If the proprietor of the trademark does not apply for renewal of the registration, the trademark will lapse. The Industrial Property Office shall inform the proprietor of the trademark from the date of expiry of the registration no later than 6 months before that date. Failure to provide this information shall not give rise to liability of the State for damage caused in the exercise of State authority under any other legal regulation and shall not affect the expiry of the registration. The actual application for renewal of the registration of a trademark held may be submitted no earlier than 12 months before the expiry of its term of validity. This administrative act entails the sending of the application and the payment of an administrative fee for the renewal of the registration for a further specified period. The renewal fee is payable within the time limit for filing an application under the law governing trademarks. If the fee is not paid within the due date, the Industrial Property Office shall, upon expiry of the due date, call for payment within 15 days from the day following the delivery of the call. If the fee is not paid even within that period, the application for renewal of the registration of the trademark shall be deemed not to have been filed and the provisions on payment of the fee after the due date shall not apply.

The owner of a trademark which has been finally revoked or declared invalid before the Office, in the event of a judicial review of the decision under another legal regulation, may file an application for renewal of the registration of the trademark within the time limits set by law, as if the trademark in question were still registered.

If the sign applied for has not been registered as a trademark within a period of 10 years from the date of filing of the application, the new applicant may file an application for renewal of the registration of the trademark as if the trademark had been registered in the last year of that period. The applicant may file the application within the time limits set by law.

The trademark is revoked in case of non-use, confusion, deceptiveness after registration or a court decision on illegal competitive conduct. The change in the effects of the revocation of the trademark shall be based on the date of filing of the application for revocation, or an earlier date if a party to the proceedings so requests. This date must be stated in the decision on the application for revocation.

2.2.5 Designations of origin and geographical indications

This part of industrial rights is governed by (Act No. 452/2001 Coll., on the protection of designations of origin and geographical indications).

A protected designation of origin is a name which identifies a product originating in a particular place, region or country, the quality or characteristics of which are mainly or exclusively due to a specific geographical environment with its own natural and human factors, and for which all the stages of production, i.e. production, processing and preparation, take place in a defined geographical area. A close link to the area of origin is therefore required for such products.

A geographical indication is a name which identifies a product originating in a particular place, region or country and having a given quality, reputation or other characteristic attributable primarily to that geographical origin and for which at least one stage of production, i.e. production, processing or preparation, takes place in a defined geographical area.

The difference between a designation of origin and a geographical indication therefore lies mainly in the required intensity of the link between the product and its geographical environment.

While a very strong link is required for a designation of origin, for a geographical indication it is sufficient that at least one stage of production takes place in the place, region or country concerned, and at least the reputation of the product must be attributable to its geographical origin.

2.2.6 Topography of semiconductor products

The details are regulated by (Act No. 529/1991 Coll., on the protection of topographies of semiconductor products).

In the industry, the production of an integrated circuit with the required function is one of the basic solutions for the placement of circuit elements in the integrated circuit volume and their interconnection. It is therefore certainly a creative work. The registration of certain topographies of semiconductor products in the State Register serves to protect such results.

The registration of the topography of a semiconductor product in the State Register can only take place on the basis of an application filed with the Office. However, the right to protection is exclusively for citizens of the Czech Republic or persons residing or having their registered office in the Czech Republic.

At present, this industrial right is hardly used.

2.3 Other special cases

For further work, I need the kind reader to take a so-called mental step aside. I ask for at least five minutes of intense mental work and reflection before reading further - it is necessary to unify our perception of the concept of know-how in the context of knowledge transfer.

- *Imagine that you have a specific set of knowledge and skills in your hands that a corporate partner is interested in. I believe that everyone is able to imagine such a specific person in their life that they go to because they understand things and are able to do them. Do you have?*

- *How can you transfer this set of knowledge and skills to a corporate partner? What specifically will you be transferring to them?*

If you can't come up with a list of specific THINGS to pass on, I recommend trying it in a group. Don't aworry, it's a bit of a pain, but once you figure it out, it will fit like a puzzle.

Finally, you will perform this mental exercise for every single transaction and technology or knowledge in the transfer profession. You have to grasp each individual thing, describe it, protect it, value it, set conditions for it. Don't worry about it, it's the most beautiful thing about being a transfer agent.

2.3.1 Classified information and information security

There are basically three reasons for keeping information secret:

1) We have committed ourselves to a contract - typically an NDA (Non-disclosure agreement, sometimes also used as a CDA Confidential disclosure agreement) or MTA (Material transfer agreement). These contracts and the details of this situation will be discussed in more detail in the chapter 5.1.
2) We are obliged to do so by law and it also determines the rules on how to proceed - for example, Act No. 412/2005 Coll. on the Protection of Classified Information and Security Clearance (Act No. 412/2005 Coll. on the Protection of Classified Information and Security Clearance).; Act on Cyber Security No. 181/2014 Coll. (Act No. 181/2014 Coll. on Cyber Security), the Civil Code (Act No. 89/2012 Coll., the Civil Code) (protection of trade secrets), etc.
3) We fall under so-called professional secrecy - this includes well-known professions such as doctors, patent attorneys, lawyers, notaries, auditors, government employees (a legal obligation) and others.

In a research organization environment, you can encounter all modes, but it is fair to say that most public research organizations do not pay much attention to information security.

Let's look at the issue of secrecy from a different angle. When should information security be addressed at a research organization?

Are we working with information whose leakage could result in damage to the research organization or funder? We are at risk:

- loss of value of the result for practical use - disclosure of know-how, loss of patentability?
- of losing "being first" in publications and grant applications?
- penalties for disclosure of information from the contractual relationship, loss of trust of the partner?

Or else, we're working in research with technologies that could:

- be usable for defence or security technologies, or directly for military purposes?
- hide ecological or ethical risks?
- cause panic or threaten public safety?
- affect the economic interests of the state?
- to facilitate the misuse of other technologies for terrorist purposes?

Or else. Think about the questions:

- Are there private profit generating entities in your industry?
- Do your researchers often leave for other organizations in the same field?
- Are there foreign researchers working at your department?
- Does your organization have experience of collaborative contract research?

- Have you ever suspected that someone was publishing your thoughts?
- Does your research have potential applications in defence or national security?

Well, if we step on it hard:

- Is research at your institution in any of the following areas: nuclear materials, equipment and accessories; materials, chemicals, "microorganisms" and "toxins"; materials processing; electronics; computers; telecommunications and "information security"; sensors and lasers; navigation and avionics; marine technology; propulsion systems, space vehicles and related equipment?
- does your organization cooperate with any of the following government bodies or does any of the following bodies use the results of your applied research: Ministry of the Interior, Ministry of Defence, Ministry of Transport, Ministry of Finance, Ministry of Industry and Trade, Ministry of Agriculture, Czech National Bank, Czech Telecommunications Office?

If the answer to any of the above questions is YES - you simply cannot avoid dealing with the issue of information classification and security. So try to approach it pragmatically and without prejudice. As in all other parts of knowledge and technology transfer, you need to keep things simple, weigh the pros and cons and use common sense.

For practical work with classified information we recommend the reader to study the Czech Technical Standard CSM ISO/IEC 27002 (Czech Technical Standard CSM ISO/IEC 27002) - Information technology - Security techniques - Set of procedures for information security measures. Within the scope of this study material we will mention only the basic principles and context:

Classification of information and resulting ways of handling it

The first thing to say is how to know what information deserves protection and classification - there may be different levels and also different claims to classification.

1) This is information that has a specific regime arising from laws - typically accounting, payroll, GDPR and so on. A specific case is classified information under Law 412/2005.
2) This is information that is competitively relevant to the activities of the research organization, typically know-how, research collaborations.
3) This is information that the institution has agreed to protect by contract - typically an NDA.

Different categories can have different levels of security.

Obviously, there must be someone in the institution who is able to classify the information. In the field of economic information this is usually the economic director, in the field of personnel data it is the personnel director. In the field of knowledge transfer, collaborations and projects - who is responsible?

Note that if the research institution is involved in security research according to Act 412/2005, then it needs a security director. Ideally, if this is also a person connected to the transfer, has influence on the research contracts and works closely with project management.

Some of the topics and areas of information that should be classified are listed in the list of classified information - * Government Regulation 522/2005 Coll. Recommended for studying on long winter evenings.

Marking of classified information

In all cases, protected information must be marked**.** If information is not marked for protection, it can hardly be assumed that it will remain protected. Designated information must be clearly identifiable and limited. The "everything we've been told is classified" practice is untenable and unenforceable because it is ambiguous. The general and recommended principle is that protected information should be readily identifiable and categorizable. You may have noticed in American movies that some files are stamped "Top Secret". Well, that's just it. Everyone knows at a glance that what's in the file is classified.

It is recommended to introduce specific wording for the labelling of information and to be very careful with the terms of Act 412/2005 Coll., e.g. "non-public" or "with restricted distribution". In case you fall under the regime of the law, then the labels are clear:

- confidential (D) is information the disclosure of which would be disadvantageous to the economic or security interests of the state,
- reserved (V) are those that could cause simple harm to the state,
- classified (T) have the potential to cause serious harm, particularly to public safety,
- Top secret (P) are those whose disclosure would be really serious trouble.

An alternative method of marking documents is to use international formats, such as the American standard Traffic Light Protocol (Agency, 2023), the use of which is not regulated in the Czech Republic (yet).

In most cases, secrecy is a temporary matter. Most often you will encounter secrecy prior to filing a patent application, reasonably until publication, for the duration of the project, or for a defined period of time after the end of the project. It is a good idea to include the date or designation until when the information is classified as part of the designation.

Persons with access and personnel security

Every classified information needs to have someone who has access to it and is authorized to work with it. A list of such persons shall be an integral part of and supplement to the file containing the information in question. Different persons may have different levels of access, as the particular situation requires.

Information may only be handled by designated authorized persons and only to the extent necessary for the performance of their work. These persons must be made aware that they are handling classified information. Ideally, they should confirm this by signing the authorized persons list. General confidentiality obligations in employment contracts are usually inadequate, again due to lack of clarity.

It is recommended that the ability to handle classified information of persons to whom we intend to disclose such information be at least baseline checked before, during and after the employment relationship is terminated or changed. If an employee who has had access to sensitive information leaves, this should be actively addressed with them. The aim is to ensure that employees (and contractors) understand their obligations and that they are suitable and competent for the tasks for which they are used.

Handling of sensitive and classified information

Any conduct that may compromise trade secrets is prohibited:

- Making copies and reproductions outside the records - each reproduction must have a registration number including the identification of the authorized person, forgetting a copy at the printer is a serious offence. Therefore, there is a password-dependent setup for printers.
- Storing it on a medium in an unprotected form and then taking it outside the designated area - a common research and administrative practice in research organizations where sensitive data is taken home on a USB drive without any protection. This is bad practice.
- access to an unauthorized person (leaving alone in a designated area) - such a security classic, recently the media ran a nicely elaborated campaign on this topic with Jiří Dvořák in the lead role. We recommend you to look it up.
- Leaving information without adequate security - no password on a loose external drive, a forgotten copy on the printer, a pile of papers on the desk, or even crumpled papers in the trash. That's what shredders are for.
- Working with information outside the designated area - in some more serious cases, especially for classified information according to Act 412/2005 Coll. It is necessary to work

with information only in pre-designated and secured areas. But this also applies, for example, to the handling of hazardous biological samples. Hopefully, no one will think of taking solutions with live viruses out of laboratories with an appropriate level of security (again).

Safety and environmental security

The aim is to prevent unauthorized access, damage and interference to information and information processing equipment.

Physical security

- Designated areas with the appropriate type of security.
- Controlled entries and accesses with a record, ideally with a time stamp.

IT security (cryptography, cyber security)

- Proper and effective use of cryptography to protect the confidentiality, authenticity and/or integrity of information - you may be familiar with the various uses of hardware keys.
- Network security against unauthorized access - a common restriction abroad according to the unique identification number of each device.

Administrative security

- appropriate administrative procedures for the creation, receipt, recording, processing, dispatch, transportation, transfer, storage, shredding, archiving, or other handling of classified information.

Examples of technologies that deserve special attention

The abbreviations of the ministries or authorities that are responsible for a given area and the typical classification levels of information from these areas according to Act 412/2005 Coll. are given in brackets for each technology:

- *Technical and transport means, equipment and materials used to carry out operational search activities, analyses and expertise (MF - V, D)*
- Information systems that process individual, integrated, analytical or cumulative accounting, financial and budgetary data of the state, including data of tax entities (MF - V, D, T)
- *Defence and Security Research (MoD - V, D, T*
- *Explosives and products for the arms industry (MIT - V)*
- *Technical means and procedures in the field of criminalistic expert activities (MV - V, D)*
- *Security systems, equipment and technology, architecture and security settings of information systems, documentation of operation and security (MV - V, D, T)*
- *Bacteriological (biological) or toxin weapons, high-risk agents or toxins (SUJB - V, D)*
- *Material and technical security, records and evidence of research and development (relevant intelligence service - V, D, T)*
- *Tasks in the field of cryptographic protection, analysis and technical development of means to protect classified information (NUKIB - V, D, T, PT)*
- *systems, equipment and technology (GIBS - V, D)*

At the end of this crazy chapter, let us mention the so-called dual-use goods, which are defined by Act No. 594/2004 Coll. and Council Regulation (EC) 428/2009. This is the regulation of the export, transport, brokering and transit of goods to prevent the laundering of the proceeds of crime, the promotion of terrorism and the fulfilment of international non-proliferation obligations - a license is required for the export of dual-use goods (MIT, Licensing Administration). The issuance of a license does not automatically ensure the exporter's export implementation, as it is subject to the independent control authority of the state - the customs administration.

- *Dual-use - goods with potential defence and security applications*
- *Tangible - products, materials, machinery and equipment, preparations*
- *Intangible - software, know-how, technology, documentation*

ATTENTION!!! - the exception for basic research here is significantly different from the Frascati Manual definition.

- *Basic scientific research is experimental or theoretical work undertaken principally for the purpose of acquiring new knowledge of the fundamental principles of phenomena or observable facts, and which is not primarily directed towards a specific practical aim or objective.*
- *Compare the definitions of basic research in different sources and think about what this means in practice.*

If the result is something you are considering for knowledge and technology transfer, you cannot hide under this exemption AND, moreover, if you are trying to transfer knowledge and technology internationally, your institution is in the role of an exporter.

As a cherry on top of the chapter, let us mention the Military Material List - the regulation of trade in arms and military material. Competence and licensing is under the MIT and there is a general license for research

BUT

An entity is entitled to offer its products and services, enter into negotiations with foreign partners, etc. only after obtaining the relevant permit to trade in military material, and furthermore, a license must be applied for to carry out specific business cases. What is involved? Again, just examples that actually occur in the academic environment:

- *Optical sights with electronic display.*
- *Chemicals, 'biological agents', 'riot control agents', radioactive materials, related equipment, components and materials*
- *"Energetic materials" and related substances*
- *Laser systems with sufficient power ... and appropriate equipment for beam handling, beam propagation and beam aiming.*

2.3.2 Know-how and trade secrets

In many cases, the previous chapter may seem completely detached from the issue of knowledge transfer. Therefore, in this follow-up we will focus on the purely practical part and expand a little the group of subjects that knowledge and technology transfer can work with.

In addition to copyright, industrial and competition rights, which each have their own set of laws, there is a huge body of human knowledge and skills that are created on an individual basis, often as a cumulative combination of knowledge, skills and the ability to use them creatively. Intuitively, the term know-how is used to describe this potential. In the research environment in particular, the value of know-how is immeasurable and dominant, purposefully created over a long period of time, and it is the direct responsibility of publicly funded research to actively work with and properly exploit this value.

Act No. 89/2012 Coll., Civil Code, § 504 - Trade secrets (Act No. 89/2012 Coll., the Civil Code)

Trade secrets consist of competitively significant, identifiable, measurable and normally unavailable in the relevant business circles facts relating to the plant, the owner of which ensures their confidentiality in an appropriate manner in his interest.

However, the legal code of the Czech Republic does not know the concept of know-how. For the practical handling of know-how, it is therefore necessary to rely on the term trade secret, which gives us a relatively clear framework for the practical use of know-how. § Section 504 of the Civil

Code identifies the features that must all be fulfilled simultaneously in order for something to be proven to be a trade secret.

Let's take a look at the individual points (Dolecek, 2022):

- **Competitively important facts** - these are information, knowledge, skills, equipment and other resources that create a competitive advantage. It need not be new or unique, it need not be special or ingenious. The mere fact that you have these is enough to enable you to compete with someone else in your field of activity. So it seems that the fulfillment of this point is pretty much automatic.
- **Determinable** - in order to work with know-how, we need to express and capture it in some way. This can be seen as an analogy to copyright - for a work to become subject to copyright, it must be expressed in an objectively perceptible form. For practical purposes, this offers the possibility of writing it down as a recipe or procedure, or recording it as an audio recording or video instruction. When recording it, it is good to start from the mental assumption that the purpose of the recording is to teach it to someone else = to enable its transmission, controlled transmission. For more complex skills, it may also be a training course, for example. Even such can be described quite clearly according to the usual standards.
- **Awardable** - if the two previous conditions are met, then this condition is automatically met. Intellectual property valuation is a separate discipline and profession, which can be alternated to some small extent by its own calculations. It is not necessary to actually carry out the valuation in order to fulfil the characteristic of a trade secret, and it is certainly not necessary to have the round stamp of an expert to do so. However, it helps to have the underlying calculations and a strategy for the financial valuation of the know-how ready, even in several variants.
- **Facts not commonly available in the relevant business circles** - very closely related to the very first condition of competitive relevance. Commonly unavailable resources are those for which some effort (financial, administrative, analytical, creative, etc.) had to be made to obtain them. You had to purchase specific equipment, learn how to use it, provide operating conditions, arrange for supplies of consumables, gradually build up a database of measured results, or create a collection of relevant samples. You can't simply go to a store or the Internet and order a whole set of these resources at list price. This condition is not sharp and may be difficult to defend, but on the other hand, it is possible to prepare for the defense by keeping a progressive record of the creation of cumulative know-how (e.g., records of versions and progressive expansion of data sets, renewal of necessary certificates, training of persons, etc.)
- **Race-related** - this is such a legalistic and difficult-to-read formulation for the layman. In effect, what the legislators were trying to say is that a trade secret is somehow transferable, transferable between different entities. It does not necessarily have to be integrally linked to the whole company, enterprise or institution. As a layman, you can imagine one family business, a limited liability company, which runs a café and a confectionery shop in one city, and in the same city also runs a retail and wholesale business in confectionery and café equipment, and in addition to that manufactures custom-made furniture and also some semi-finished products for confectioners. Thus, one company has several plants: a café, a confectionery shop, a furniture workshop, a workshop for the production of food semi-finished products, a brick-and-mortar shop and a warehouse with distribution facilities. An example of a trade secret related to just one (or a few) of their factories will readily come to mind. The customer lists alone can be several and very different. Each of them can be independently transferred together with a plant, or even separately.
- **The owner ensures their secrecy** - practically the most important condition of trade secrecy. If you don't treat it as a secret, you probably can't defend it as a secret. In this context, we can recommend studying the Czech technical standard ISO/IEC 27002, which we will mention later, and which forms a set of procedures for information security measures. In order to defend and make practical use of trade secrets as objects of knowledge transfer, it is necessary to introduce certain measures - for example, a know-how register.

Register of know-how

If you are serious about the management and transfer of know-how in a scientific environment, you have no choice but to introduce a know-how registry for several reasons.

What will the registry bring you?

1) You will have a clear basis for collaborative research contracts (knowledge background), including the basis for pricing and subsequent costing.
2) You will be able to distinguish knowledge transfer from a simple research service and avoid the dangers of "contract research". Moreover, you can easily defend the transfer even before strict officials - you can prove the existence of a trade secret with an earlier date than the contract for its transfer or use.
3) You will be able to safely use the exemption from the obligation to publish contracts in the Register of Contracts. The substance of a contract that is a registered trade secret is uniquely identified by a number or combination of numbers that you can safely disclose, and the know-how itself no longer needs to appear in the contract at all.
4) This will make it easier for you to work with the originators and specify the scope of the cooperation, and overall speed up and facilitate the process of drawing up cooperation agreements.
5) Your accountants will love you because they will find it much easier to work with numerical items that have clear prices and clear inclusion in the chart of accounts than with a multifarious and elusive chimera of intellectual property without copyright or industrial rights.

What do you have to do?

1) It will first be necessary to write down or otherwise record each individual know-how for which transfer is contemplated. Ideally as a cookbook, a recipe, a video tutorial, a training course or a combination of any of these. Perhaps in a structure: in the first step I do this, in the second step I do this, here, depending on what I see, I select this, if it's red I know I need to go back three steps, and so on. I try to be as objective as possible, specifying selection parameters (if possible) or recommended intervals of values. Try to minimize the influence of subjective perceptions and impressions. Like trying to teach the same skill to someone else. This is actually the principle essential know-how.
2) Identify and draw up a list of persons who are authorized to see and work with the know-how - it must be with each KH and each person on the list must sign it or clearly confirm that he/she knows that it is your trade secret.
3) Assign a unique number to each know-how. You can design it any way you like - year/lab/grant/mascot/whatever/007. The list of identification numbers should be kept by someone who is responsible for managing intellectual property in the institution and should certainly be accessible to transfer and those working with projects.
4) Establish a system for maintaining a list of know-how and related information. Usually a simple Excel spreadsheet will suffice, a database is great of course. What the list must necessarily contain is:
    a. Identification number of the know-how in question
    b. Name (never mind cryptographic, KPR37a type technologies are best)
    c. Information on the location and method of storage of know-how
    d. List of authorized persons
    e. Other information - for example, licenses and other contracts in place. This should already be linked to a complete knowledge transfer data system.
5) Choose an appropriate storage location - it may be in paper form, then a vault is recommended, it may be digitally on a designated encrypted protected disk storage. It is recommended that the files are encrypted - handing over the password then means the files

are made available. Password management can be handled with available tools, but encrypted.

6) Identify each document as know-how and its number. Appropriate wording in the header or watermark - for internal use, not to be distributed outside the circle of authorized persons.

7) Prepare and implement an internal directive so that everyone who will work with know-how knows what they can and cannot do. For example, make signposts and number the copies each time they are printed - copy 1 for Mr X, copy 2 for Mr Y (then if it is left lying around, at least they know who is responsible) - it is advisable to use ISO/IEC 27002. All those on the list of authorized persons should confirm in writing that they have read this directive.

8) For each know-how, there may or may not be a calculation or description of how commercialization can proceed with it - individually in the full range of possibilities. Something will have a list price (this is especially true for those things that enter into contracts frequently) - but at that point you have a clear transfer and item on the invoice. Something may be reflected in people's work and their hourly wage (those cases where it's very much about their experience), something may be licensed as a percentage of future usage, etc.

Once the registry is in place and continuously maintained, know-how and trade secrets can be fully traded - licensed, entered into collaborations, valued, and calculated. You have a ready-made tool that no lawyer or accountant can refuse.

2.3.3 Nagoya Protocol

In contrast to the previous chapters, the Nagoya Protocol commitments (Act No. 93/2018 Coll. on the conditions for the use of genetic resources under the Nagoya Protocol) seem like a walk in the park. On the other hand, we already have a few cases where a scientist has ended up in prison in a developing country simply because he did not respect the regulation. We place this area on the periphery of the transfer agent's work, because it is closely intertwined with material and sample sharing activities (governed by MTA-type contracts) and should therefore be a cautionary tale to keep in mind. Getting scientists out of jail is unlikely to be necessary as a transfer agent.

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is an international agreement that establishes a legal framework for working with genetic resources. It entered into force in 2014 and was written into our laws in 2018. Its implementation is the responsibility of the Ministry of the Environment.

The main objective of the Nagoya Protocol is to curb biopiracy in developing and post-communist countries where a genetic resource used to be obtained free of charge and then patented and used in an economically developed country. This usually happens in the pharmaceutical or agricultural industries. The procedure under the Nagoya Protocol should guarantee that the profits from the use of genetic resources will also return, at least in part, to the country of origin. Therefore, a system of rules and documents is being put in place that permit the collection and use of genetic materials from natural or cultivated stocks, including monitoring the journey from the country of origin, their storage in various banks, and their gradual examination up to the final use.

It is the duty of the transfer agent to know how to handle such material, to use an MTA-type contract when transferring it, which also includes a stipulation that the material falls under the Nagoya Protocol and to provide complete documentation along with the sample. Think about this especially if you are involved in biological research and development leading to new drugs, chemicals or cosmetics.

3 Proof-of-concept

Proof-of-concept (PoC) is a phase in which it is verified that a concept/idea or theory has the potential to be applied and established in the real world. PoC is evidence that a project or product is feasible and sufficiently proven to justify to some extent the costs required to support and develop it.

To some extent, PoC can be seen as a prototype that is intended to determine feasibility. It is mostly required by investors, who use this step to verify tangible proof that the launch of their subsequent business proposal can guarantee a healthy return on investment Project managers use PoC to identify gaps in processes that could prevent the product from succeeding. It is therefore a very important intermediate step in the commercialization process itself, to ensure that any subsequent contractual transaction is successful, providing both partners with significant certainty in the functionality, feasibility and applicability of the R&D result.

What does the internal system of approval of partial projects look like at a Czech university? As an example, let us take the system anchored at the University of South Bohemia in České Budějovice.

The whole process is covered and administered by the Office of Technology Transfer of the University of South Bohemia (KTT JU), which is responsible for this area, among others. First of all, an internal call is issued within the University of South Bohemia with the specification of conditions, in particular the maximum required budget amount, the duration of the sub-project, the outputs of the sub-project, the structure of eligible costs, etc. In the course of the call, the JU KTT reviews, consults and recommends project proposals to the researchers. As a rule, KTT JU also organizes an informative seminar for the submission of sub-projects and detailed rules of the call, which is usually of great interest. After the end of the internal call, a check of administrative compliance is carried out and additional documents are requested if necessary. In addition, the technology transfer office performs a preliminary check of the patent databases for novelty as well as a search of the current project databases. The JU KTT verifies through the search the commercial potential of the future application of the proposed R&D result to be validated. Subsequently, all sub-projects are submitted for decision to the so-called Commercialization Council, which is one-third represented by representatives of the commercial sphere, the financial sphere and the scientific sphere of JU. Based on its recommendation/non-recommendation, the research teams are informed.

With the research teams that implement their PoC activities, they communicate throughout the whole time of the sub-project with the JU KTT, which comprehensively provides administration of the whole sub-project (dealing with orders, invoices, advice and consultation, etc.).

The Commercialization Council continuously approves quarterly reports, changes to sub-projects, and evaluates the progress of implementation of the verified R&D results during the course of the sub-project.

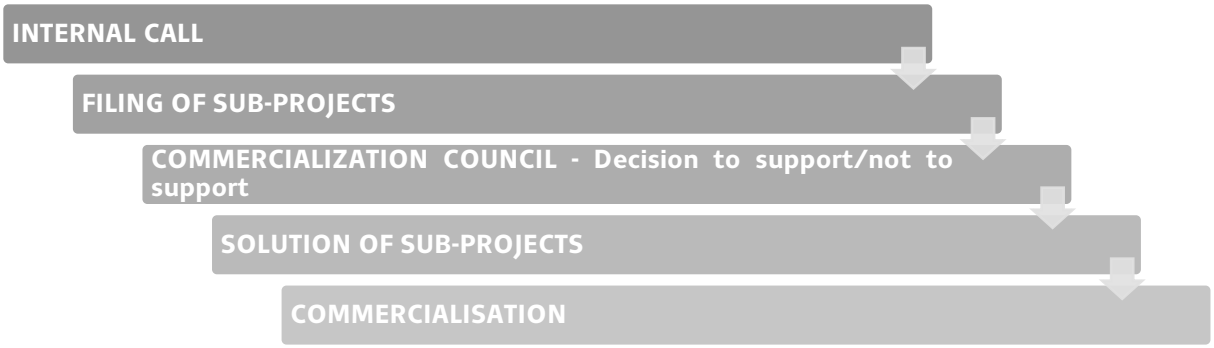


Figure 6 Approval of proof-of-concept (PoC) sub-projects

What happens after the PoC proof of concept is completed, again using the example of the University of South Bohemia

After the completion of the sub-project implementation, the Technology Transfer Office of the JU requires from the principal investigator according to the conditions of financial support allocation: final report; result/results of the PoC activity intended for commercialization; identification of areas and companies for commercialization, with this activity is also related to the discussion of the method and form of commercialization.

Following the submission of the final report and the required documents, the KTT JU publishes the results for commercialization on its website and on project databases where the latest technologies are presented (jctt.cz, HKTD, IPI, Transfera database, etc.). In parallel, the commercialization manager addresses companies in the area and initiates negotiations with representatives of the commercial sphere. Once a year, the principal investigator, in cooperation with the head of the JU KTT, presents the progress of implementation to the Commercialization Council.

Sustainability Plan for the Commercialization System at the University of South Bohemia in České Budějovice

In terms of the long-term sustainability plan of the commercialization system, the result of R&D is recorded in the internal documentation system of KTT JU and in the system of software for tracking intellectual property of the University of South Bohemia, which monitors both the complete documentation of intellectual property of the University of South Bohemia and economic statistics, or all financial costs related to this issue, including possible commercial application. This record is kept from the moment of identification of commercial potential onwards. At the same time, the head of the KTT uses this system to involve the necessary specialists in the sub-projects, delegate tasks, monitor outputs and at the same time evaluate the progress and performance of the sub-projects. All this with the aim of applying the results in commercial practice. Information on the progress of the commercialization of results is provided by the head of the KTT to the Vice-Rector for R&D and to the members of the Commercialization Council in the form of regular interim reports. In case the commercialization is successfully completed and generates a profit, the procedure is followed according to the applicable internal guidelines and the distribution of the commercialization income is distributed according to the Rector's measure on the disposal of intangible assets R 274_2014. The key in this phase is first of all communication with the research team - and subsequent communication at the regular KTT meetings once a month.

Within the implementation period, the Technology Transfer Office of JU provides the following activities: costs including marketing and promotion of research and development results, targeted contacts and negotiations with companies (licensing negotiations, etc.); presentations at exhibitions, trade fairs; operating material; fees - access to databases, clusters, platforms; professional services - external experts if needed; P.R. - on web platforms Jctt.cz, IPI Singapore, HKTD, Transfera.cz, DEIP, etc.

Significant financial support instruments for PoC activities in the Czech Republic

At the outset, I can mention that the University of South Bohemia as such does not currently have the financial resources available to support PoC activities itself. For this reason, it is trying to raise significant funds from other financial sources. For up-to-date information on available calls from national and international sources, please contact your transfer office.

3.1 Identification and recording of results

In addition to their core activities, public universities or academic institutions also become a source of information and new knowledge that can be used in the commercial sphere. This knowledge contributes not only to the development of knowledge but also to development in the social sphere. Applied research and development results from commercial entities can also provide funding that will subsequently be used to further the overall development of the institutions concerned.

In the event that a research and development result is identified that could be protected as an industrial property object, it is necessary to understand that its industrial legal protection must first be ensured. The staff of the technology transfer office will advise you on the possibilities, including its complete provision. You will then fill in an originator/co-inventor notification and this starts the whole process.

This will allow the employer to see the result in its entirety. Once the employer has been duly informed, a period of 3 months begins within which the employer must decide whether or not to exercise the right to the result. In most cases, only those results that have been assessed as commercially interesting and whose further development will be burdened with a lower risk of failure than those that have not progressed to the next stages are selected for industrial law protection.

The most important milestone in the decision-making process is primarily technological factors - in particular the novelty, innovation of the solution and the maturity of the technology. Market and economic factors are another milestone for the decision to initiate the industrial protection process. Finding a market potential with a sufficiently large market is a key factor for putting a scientific result/technology into practice.

Specialized technology transfer offices should prepare an opinion on each notified result with possible commercial potential, which includes the above-mentioned technological, economic and market factors, as well as recommended forms of industrial legal protection, an analysis of the financial complexity of protection and, if necessary, a preliminary plan for putting the result into practice. This opinion is forwarded both to the researcher - the originator of the R&D result - and to the dean of the relevant faculty and subsequently to the rector of the university to facilitate the decision whether or not to exercise the right to the result.

The prepared opinion of the technology transfer office should include information on whether the result was part of an ongoing project, who will pay for the costs associated with the industrial legal protection as well as information on who is the main originator and possibly other co-originators.

Based on the mapping of common practice at universities and abroad, it is advisable to include the opinion of the head of the department and possibly also the commercialization council in the TT process at universities in the Czech Republic between the notification of the originator and the opinion of the technology transfer office. In the system of internal calls for researchers to validate R&D results, the Commercialization Board is often the key and decisive body for the distribution of such financial support. This board therefore has a comprehensive overview of R&D results and their subsequent application in the field of intellectual property or industrial protection.

The precise definition of the basic headings, classes and patent claims seems to be essential in the transfer of explicit knowledge from the technology transfer office towards the Industrial Property Office for its externalization. This step requires a good knowledge base and stored knowledge shared for the entire patent office. In practice, it turns out that patent offices in particular have sufficient subject matter experts or are able to cover most fields. In contrast, technology transfer offices usually do not have the subject-matter staff necessary to outsource IP disclosure. The competence of these knowledge workers is crucial for the definition of the different subparts within the patent claims, not only in terms of recognition and smooth running of the invention procedure, but also in terms of future competitiveness.

However, the process does not end with IP protection alone. Subsequent commercialization is also crucial, where the TT office handles follow-up communication and actions outside the university. There should therefore be an effort to pass explicit knowledge on.

3.1.1 Knowledge management model

At present, there is no professional anchoring of technology transfer management in the social sciences. Knowledge management is the discipline that has a proper theoretical basis and a link to technology transfer. It is based on the management of knowledge, both explicit and tacit, both of which are absolutely crucial for effective technology transfer. (Štemberková, 2019) The interrelation and transformation of this knowledge within the discipline of knowledge management is described by the so-called SECI model (Nonaka & Takeuchi, 1995). The processes of internalization, externalization, socialization and combination are also crucial for technology transfer.

The knowledge management model is a model that explains how tacit and explicit knowledge is transformed or converted into organizational knowledge. At the center of this model is the originator or group of co-originators, from and to whom knowledge and information flows. In the direction of externalization, it is mainly about the disclosure of intellectual property, i.e. the

conversion of tacit knowledge into explicit knowledge. In the combination process, explicit knowledge plays a dominant role, namely: the activities of the technology transfer office, the search for interested parties for R&D results and the processing of all follow-up steps. This also includes comprehensive IP protection and patent portfolio management, as well as project administration and project management."

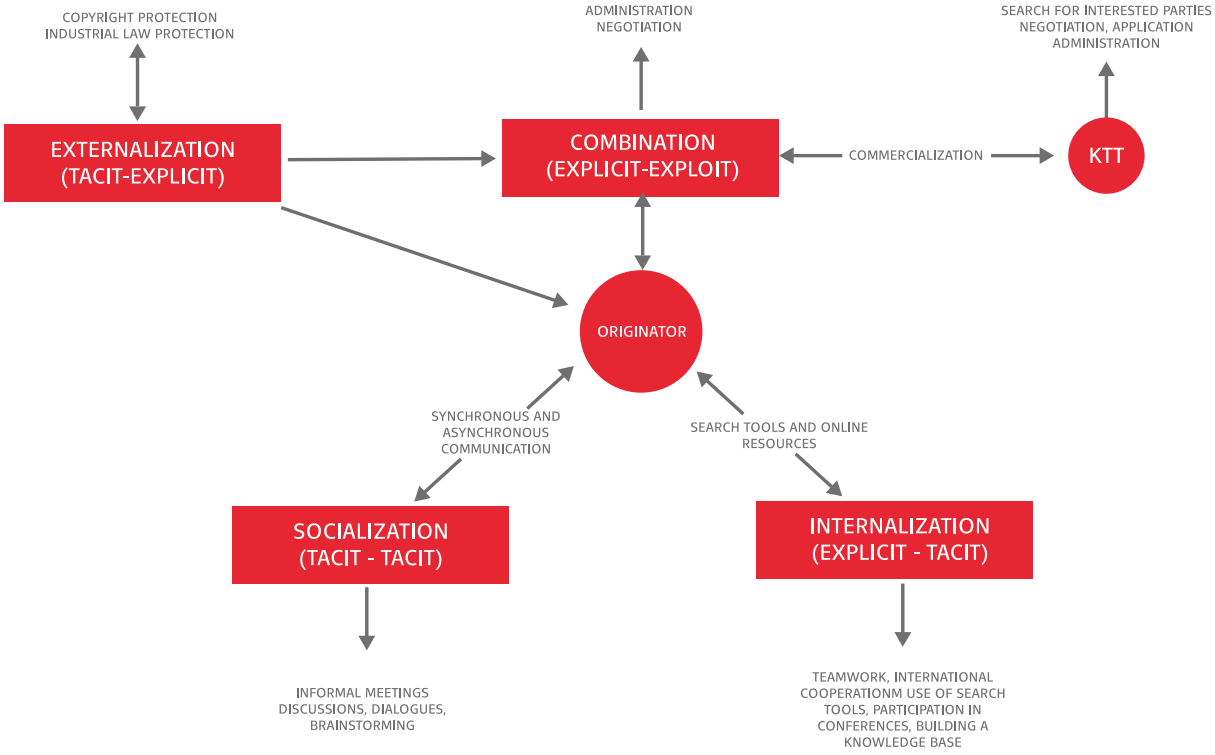


Figure 7 Knowledge management model for effective technology transfer ZNATechTrans - based on SECI model

Another downstream process is the process of internalization, in which explicit knowledge is transformed into tacit knowledge. In this part we count, first of all, teamwork, selection of appropriate tools, comprehensive searches of patent literature in publicly available databases, participation in conferences and trade fairs and creation of personal contacts, etc., international cooperation.

In the next downstream process called socialization, from the perspective of technology transfer, synchronous communication, informal meetings, discussions, dialogues or brainstorming take place. It is also about establishing communication with people in general or international cooperation.

It is therefore true for all disciplines that internalization through search tools and online resources and through teamwork, international cooperation, participation in conferences, and thus building a knowledge base changes explicit knowledge into tacit knowledge. As such, externalization turns tacit knowledge into explicit knowledge. A typical example is the results of R&D, whether in copyright or industrial law protection. In the course of the combination, the transfer of tacit knowledge to explicit knowledge takes place precisely during the application administration, negotiation and commercialization process itself.

According to the diagram (Figure 5), it is clear that it is a generalizing schema that is applicable to any sub-model of sub-disciplines without differentiating them, for the reason that all these steps or parts of the model are the same and solved for all disciplines in the same way, without sub-differentiating them into humanities, technical-construction or natural medicine disciplines.

A model of effective knowledge management related to the creation of intellectual property as an employee work at universities according to the structure of individual faculties and their main area of focus. The model is understood here in the context of this work as a proposal for improved procedures, processes, as a set of rules and recommendations on how to work with knowledge, intellectual property from its creation to its commercial use. The design of the model is based on the following areas:

- research of knowledge management methodologies, both their original forms and modified versions applied in a specific field; the focus was particularly on working with tacit and explicit knowledge, which is also crucial for intellectual property protection,
- literature research on the state of intellectual property protection and technology transfer in the Czech Republic and worldwide, benefits, barriers and key activities,
- analysis and patenting activities at universities in the Czech Republic by faculty,
- analysis of selected internal factors of the university with the assumption of influence on patent activity at the university,
- Analysis of the motivation of scientists at universities in the Czech Republic,
- analysis of the current remuneration of originators in the Czech Republic and abroad.

The model needs to be further expanded to address key barriers to effective transfer, such as the lack of training in the field, long approval procedures, an insufficient and opaque incentive system focused primarily on publication results, too frequent changes to the system, legislation and regulations, and the lack of budget allocations for technology transfer start-up costs (Štemberková, 2019).

In summary, the elements of motivation can be represented by links to competent actors at the university (Image 6).

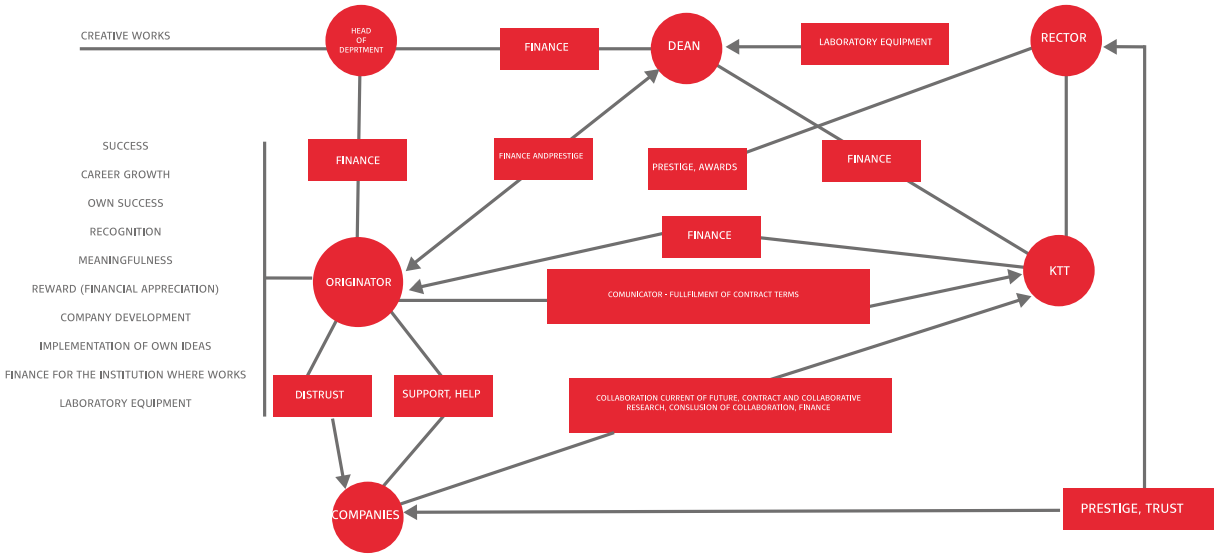


Figure 8 Elements of motivation for academics in the field of industrial protection

3.2 Current process setup at Czech universities

"The current state of the "normal general practice" setup of technology transfer in universities in the case of the existence of a TT office is characterized by Figure 7. The originator produces the R&D result through his creative activity during his employment. Subsequently, it is necessary to evaluate, independently or with the help of the technology transfer office, whether such a result is eligible for industrial-law protection. The technology transfer office, which is set up at most universities, informs the originator of this result, and it is also advisable for the originator to inform his or her supervisor. From the date of the notification by the originator, the time limit under the

Inventions Act begins to run in order to decide whether the university will accept the result as an employee work in its possession. This time limit is set by law at 3 months. This decision usually requires an opinion from the technology transfer office and a decision by the dean of the faculty where the result was created, as well as a decision by the university rector. The originator is then informed immediately and signs a consent to transfer the result to his/her home institution.

The employees of the technology transfer office actively address the necessary issues with the originator, agree on the procedure and make recommendations for the preparation of the actual transfer of the identified R&D result.

Subsequently, the technology transfer office begins to administer and prepare the required application for the selected industrial legal protection to the Industrial Property Office or hires a specialized patent office if it does not have experts in the field. If a patent office is hired, it usually communicates through the technology transfer office with the originator(s) regarding the exact description. After the application is prepared, it is sent to the originator for final examination according to the usual practice, then filed with the Industrial Property Office and an administrative fee is paid. In the course of the procedure for the grant of targeted selected protection, in the case of sent statements or other requirements, the Industrial Property Office communicates with the applicant, either through the patent office or the technology transfer office. They then communicate in the same way, if necessary, towards the originator. Once all the legal requirements have been met, industrial protection is granted and the applicant is informed. Once this information is received by the technology transfer office, it informs the originator and registers the result in its system, including the setting up of the monitoring of renewal periods. At the same time, there is usually an administrative fee associated with this action, which is again handled by the technology transfer office.

However, this is the moment that is important for the following steps related to the commercialization of the result itself. This is the prerogative and competence of the technology transfer office, which must prepare the commercialization plan. Subsequently, the office must find suitable companies in the field and start communicating with them about the possible and appropriate way of commercializing the result, which may be different each time, according to the possibilities mentioned in the model. However, the cooperation with the originator(s) itself is very important in this step, because of the absolute knowledge of the R&D result itself. However, despite the links set up in this way, the results of the technology transfer offices are often below the expectations of the university management and often the inefficiency of the processes is evaluated by the employees of the technology transfer offices themselves.

In summary, it seems crucial to support these sites throughout the process:

- the originator / group of co-originators - his/her/their motivation - i.e. to ensure the administration related to the protection of the intellectual property itself and to ensure links to experts and leaders in the field for possible follow-up work,
- the workplace of the originator/co-guides - here is very crucial: a well-functioning team - a working collective with a transparent overview of internal rules, an environment of support and motivation, related adequate equipment of their workplaces for a good background for their work,
- technology transfer office - good knowledge of internal processes for dealing with intangible goods, clearly defined notification of the creation of an employee's work (R&D result) that needs to be addressed in terms of intellectual property protection and determination of the appropriate type of industrial-legal protection, conducting a search on freely accessible searchable databases and evaluation of novelty and industrial applicability,
- commercialization process - to approach suitable application partners in the field with the protected result and offer them the R&D result, then communicate and facilitate the conclusion of a contractual relationship or possible follow-up mutual cooperation. In the case of concluding a contractual relationship, the main task of the technology transfer office is to monitor the fulfilment of the individual points concluded on the part of the scientific research organization towards the application partner, and vice versa,

- cooperation with other scientific teams (internal, national and international); with regard to the given R&D result, to look for the possibility of linking to other teams in the given field or in a necessary follow-up field at national or international level for its possible further development or extension, increasing the possibilities of its use, etc.

The key knowledge in the whole model is:

- knowledge related to the R&D result itself - i.e. its content, uniqueness, novelty and uniqueness, industrial applicability, searches in available databases to verify the novelty and uniqueness of the resulting R&D result,
- protection of the resulting intellectual property - expert evaluation and knowledge of whether it will be protected by a utility model, patent, trademark or other form of industrial law protection, where the patent will be filed and whether any extension of its protection to other countries will be claimed within the time limit,
- handling of the R&D result in the process of commercialization - knowledge of the size of the potential market, possible customers, possibilities of concluding a contractual relationship and under what conditions, in case of concluding an agreed contractual relationship - monitoring the fulfilment of individual set conditions.

The key processes are:

- Internal process for notification of the creation of an employee work,
- internal process for accepting/rejecting reported employee work,
- the process of protecting intellectual property,
- the commercialization process. (Štemberková, 2019)

4 Patents as law and source of information

In the chapter on intellectual property (2.2) describes the system of protection of industrial rights, in particular patents, which is harmonized almost worldwide under international treaties. In this chapter we will discuss how to use this system not only to protect one's own rights, but especially to obtain extremely useful information for one's own work.

It is essential to realize that a patent is a monopoly right. At its core, a patent is designed to trade and restrict the rights of others in the market. A patent has some fundamental differences from copyright:

- **Creation of rights** - unlike copyright, which arises automatically when a work is created, industrial rights arise only when they are registered. In practice, this means that you have to draw up an application, submit it with all the annexes to the office, the office will conduct the proceedings on the application and, if you are lucky, you will live to see a patent granted. Maybe, and in some places. If the subject matter of the patent is worth something, you will very likely also go through several court proceedings to defend the validity of your rights. In some countries, this is a straightforward part of the patent process, and the tradition is that if no one is litigating your invention, it's not worth anything.
- **Territorial restrictions** - only apply where you pay for this right. By no means all countries in the world work with patents and the fees for maintaining patents are not at all uniform. The cost of maintaining a so called worldwide patent is completely nonsensical. Maintenance fees increase over time and you have to consider very carefully whether it is still market-worthy in a given territory. That is, whether the benefits of securing a monopoly outweigh the costs of maintaining and enforcing it.
- **Time limit** - only valid for as long as you pay for the right and the price increases over time. In addition, it is limited in international treaties to a maximum of 20 years from the date of first application. In some cases up to 25 years (SPCs for pharmaceuticals).
- **Enforceability of rights** - just because you have the right to a monopoly does not mean that someone will not infringe your right. On the contrary, the fact that you pay for a patent somewhere implies that you have evaluated the potential of the market and believe that the costs will be lower than the benefits = there is a market and there is always another player to enter the market. Business is not a white dove or the most moral part of human nature. So market policing and enforcement is your job and needs to be included in strategic considerations of where and why to protect your monopoly with a patent.

When we work with patents in technology and knowledge transfer, we have to work with two worlds, business and academia. But their needs are quite different. The role of the transfer professional is then to explain to academics the real nature of patenting and to manage the efforts made to produce patent documents according to their strategic value. A patent is not a paper confirming that the originator is a great scientist. A patent is a business value!

Let's try a little exercise - what might be the motivations for a researcher from a public research organization to apply for a patent? A What effect will this have on the form of the patent?

Moral exercise - how do you approach situations where an academic comes to you with such a request? And what does the management of the institution say?

In order to understand the patent system and its enormous information potential, it is necessary to take a brief look at the process and basic concepts of the patent procedure.

4.1 Patent proceedings.

Unlike copyright, industrial rights do not arise automatically, but require considerable effort and resources to obtain. The initiation of patent proceedings should be preceded by a detailed strategic analysis covering many aspects, such as:

A patent is legal protection for an invention that is new, the result of inventive activity and capable of industrial application (Act No. 527/1990 Coll. on Inventions, Industrial Designs and Improvements). However, a patent is primarily a monopoly right bought by the obligation to publish

a very specific description of the protected solution so that anyone can find it and either agree with the rights holder on a license to use it, or be inspired and invent for their own use another, better solution that does not interfere with the scope of protection.

Novelty is a basic condition for an invention to be protected by a patent. This means that on the date of filing the patent application, the so-called state of the art is fixed, on which it will be assessed whether the claimed solution is novel (§5 in (Act No. 527/1990 Coll. on Inventions, Industrial Designs and Improvements)). In practice, this means that the patent examiner will search the available technical and patent literature, regardless of country or author, and if he finds a document where the claimed solution is described, he will reject the application. It follows that self-publications or lectures by the originators may be a bar to novelty, while student papers, conference papers, or popularization and promotional articles in journals may be a bar to novelty. The unpleasant news is that even papers that may not have been published at the time of application will be considered (the 18-month deadline for publication).

In addition to novelty, **inventive activity** also determines whether creative activity was necessary to find the claimed solution, and thus whether the claimed solution is not obvious to a person skilled in the art (§6 in (Act No 527/1990 Coll. on inventions, industrial designs and improvement proposals)). This criterion is much less objective than the novelty criterion. The examiner should be sufficiently skilled in the fields he or she is assessing and then search the documents for solutions from which the claimed solution could be pieced together. In this case, fortunately, he is working only with those that were already published at the date of application. Even so, some proceedings can be fun, especially if you are in a completely new field, opening up new areas, touching on controversial topics.

Meaningful markets and usability is a key parameter for territorial scope, which has a direct impact on financial and process requirements. Research organizations are usually not able to put an invention into practice and deliver it to the market on their own, they need a partner or several partners to do so. Licensing agreements will need to be concluded with partners, which may not be easy to negotiate. The motivation for filing a patent application affects the whole process in a fundamental way.

Law enforcement is a huge weakness of Czech research organizations. They usually do not have the capacity to monitor what is happening on the market and whether someone is violating their rights. They do not want to get into legal disputes, even though in some foreign countries patent disputes are the most important part of the patent procedure. And sometimes also the source of the largest financial flows (patent trolling may be immoral, but it is a profitable business).

There are several stages in the patent procedure. It is important for the transfer agent to be present at all stages and not only to have access to information, but especially to be able to influence the whole process. It is very unfortunate if one is given the task of getting a patent that was written and obtained with a different motivation than getting it into practice (see the previous exercise). Several publications offer a nice overview of patenting issues, including (Collective, undated),

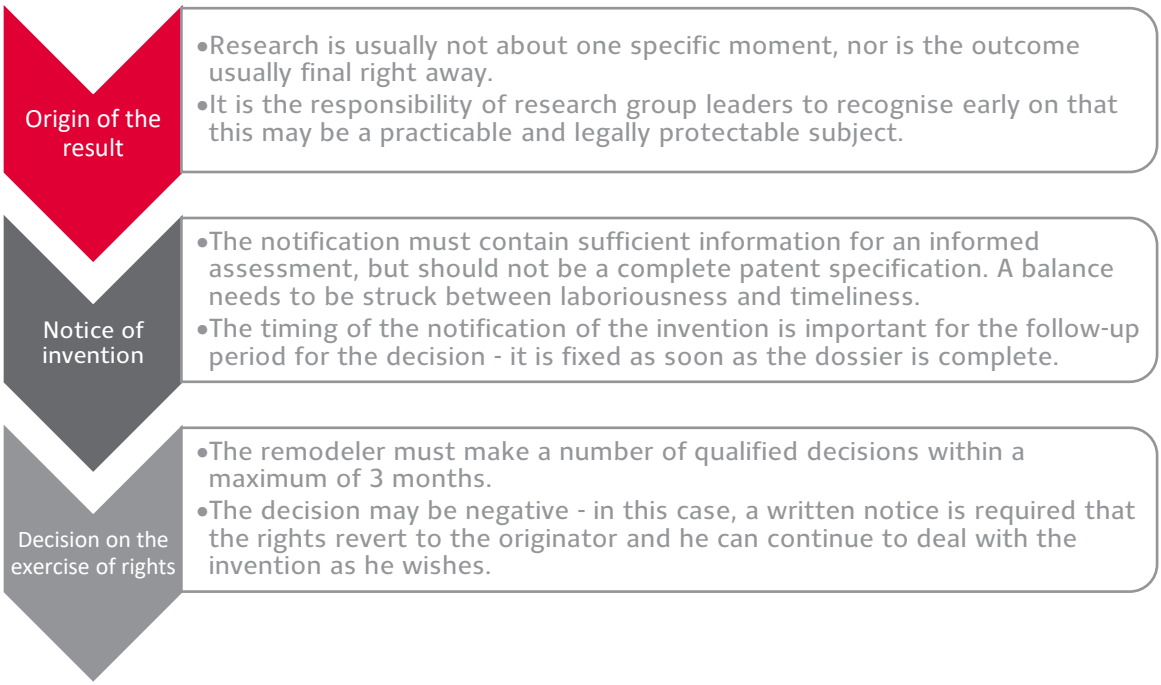
4.1.1 Phase 1 - before filing a patent application

This is a preparatory phase in which a number of activities should take place. It is the time for:

- Preparation of quality documents for strategic assessment and decision making = not only description of the solution, but also research in patent and technical literature, market research, verification of the context of creation and limitation of use (contractual relations), clarification of motivations and intentions and many others
- Strategic reflection on the possibilities and potential for exploitation
- Exercising employer's rights and related administration
- Preparation of the actual content of the patent application

All the necessary steps can take a considerable amount of time and the total duration of this phase is highly variable and dependent on many factors. With some degree of generalization, it can be

said that the greater the pressure to reduce the time required for this phase, the less chance there is for practical application afterwards.



Throughout the duration of Phase 1 it is necessary to keep as much information as possible about the subject of the technical solution under consideration confidential. This phase is also the latest time to critically consider whether the technical solution is subject to special treatment (see chapter 2.3.1).

If it is decided that the solution will be protected by a patent (or other form of industrial property), intensive cooperation is established with a patent attorney who will help prepare the patent application itself. However, he/she is not responsible for its content in terms of other than formalities. The requirements of the individual parts of the patent document are described in chapter 4.2.2, for those interested it can be recommended to study the instructions of the President of the Industrial Property Office for the standards of the invention application (Kratochvíl, 2022).

Make a list of all the decisions that need to be made before filing a patent application and organize them by timeline. Add information to each decision about who needs to make it. What supporting documentation is absolutely necessary to do it, and which can improve the quality of the decision.

Make a list of the administrative steps that need to be taken in the case of an employee invention.

In addition to all the possible strategic decisions such as: where and when to file the priority application, where to expand, who will be the partners, who will pay for it, what are the motivations and needs of the applicants, we also need to prepare the application text itself in close cooperation with the patent originator. This is where the role of the transfer agent can be very interesting.

Practice in the Czech Republic shows that awareness of the meaning of patenting is usually very low among originators, corresponding to the general ideas of society. Therefore, usually the first idea of the originators of what will be subject to protection is not what is good to protect after all. This process of transforming the subject matter can be difficult for the originator and is often resisted. Without this transformation, however, the real value of the patent may be questionable. You then have in your hand a patent that is in principle unenforceable in practice. A patent attorney's options and competence in this regard are limited, for the patent attorney's primary client tends to be the originator as the applicant's representative, and unless the applicant's interests are protected by another competent person, they are easily overlooked.

It is necessary to properly define and clarify with the originators very thoroughly what is the subject of their invention to the smallest detail not only technically (here the problem is not so big), but especially in relation to competition:

- What practical problem does their solution respond to, how does it address it?
- Where are the limits and restrictions of the solution I am applying for? What does a minimalist functional variant look like?
- What is the practical state of implementation of the solution? Where would we place it on the TRL scale?
- What types of primary outcomes does this consist of? What kind of previous results did it come from? What all was used to create the solution?
- What exactly is new about it?
- What have you been through? Has it gone through different versions, different testing, validation, corporate partners and feedback?
- What is everything related to the technical solution itself, what could be related to future applications? What will need to be offered in addition - training, service, technical support, methodologies, manuals?
- Why were the existing solutions not applicable? What were their limitations?
- What is the state of the art, patent purity?
- Who are the competing groups and what are their solutions? Do you know them?
- Who are the future users of the solution and who are its producers (the whole chain)?
- What is the business analysis of marketability?

In parallel, it is also necessary to verify the prerequisites for legal protection, i.e. whether the invention is patentable:

- Who knows everything about the solution? Have you published it anywhere even partially? Is it the subject of any student papers?
- Did you conduct a patent search during the solution? Do you know the state of the art?
- Does this meet the criteria for legal protection? (it's a work, an invention)
- How difficult is it to analyze it backwards?
- What's around? Isn't the production also new, different, improved?
- Who are the real originators/authors? And who legally owns it?
- Have you addressed the so-called "patent purity" (freedom to operate) for future applications?
- Where do you stand on time and the need for further action?

And a whole range of related issues. Verification and questioning must be done repeatedly, and information must be verified and supplemented from objective sources. By asking these questions, you are also starting an analysis of the so-called application potential.

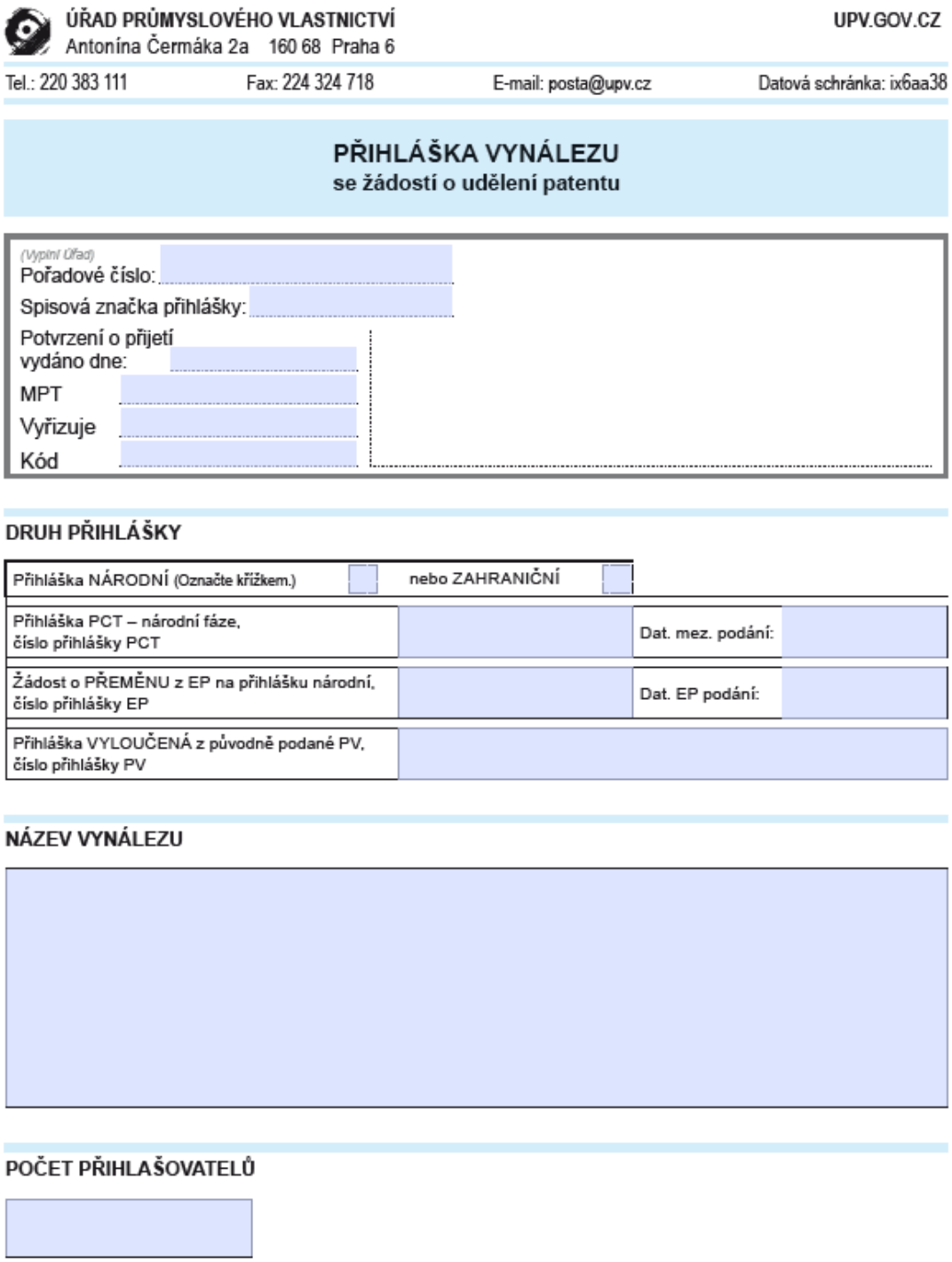
What the patent attorney will help with is the selection of the appropriate **category of invention**, which then influences the complete formulation of the entire text. One technical solution may fall into several categories in its complexity, but it is necessary to keep the categories strictly separate. The categories of invention must not be mixed, each requiring specific descriptive language. If the solution is complex, it may be included in more than one category, but in practice this means that each category will have its own section in each prescribed part of the body of the specification (in particular the gist of the invention and in the claims). This makes the text difficult to read to the point of being incomprehensible and the originator annoyed that parts are repeated. It is necessary

to convince them that this is meaningful and relevant, especially in terms of future enforcement. So what can be the categories of invention:

- **Thing, device, apparatus, chemical, product** - it is a concrete graspable object. It is described in its resting state as it stands or lies on a table or anywhere else. Nothing is moving on it, nothing is being done to it, no process is occurring in it. When describing it, it is very helpful to draw a block or experimental diagram. It helps to draw more diagrams to distinguish between the necessary functional setup and the improved solutions. It is not necessary to use them in the patent document, but they help a lot for the description. In the text, phrases such as "consists of", "comprises", "are arranged in a direction" are then used. Keep in mind the legal interpretation of these phrases from the perspective of someone who may want to limit your scope of protection.
- **Procedure**, **method**, **way of execution** - it is described in the dynamic state of the ongoing processes regardless of what performs them (marginal information). In this category, it helps to build a flow chart of the process. Progressive verbs are used to describe what happens where, in what temporal sequence, or by what means. For high quality patents, the explanation of why it is being done is omitted. Processes and methods are a favorite category of academic inventors, but again, it is important to remember and think about the other side's perspective. How difficult will it be to prove that someone is using your method? How, how will one know that someone has made something using a protected process? The legal enforceability of methods without an accompanying specific result is extremely difficult.
- **Application** - a specific category that can be used when you discover completely unexpected effects or possibilities of previously known things or processes to do something completely new. This category most often struggles with claims of inventive step. For example, it may be a situation where you discover that a drug is also a great substance for making sculptures or cleaning old papyri. In the text, you then just refer to the known thing and focus on the specific conditions of its use. Usually this category is accompanied by a method. For an example of practical use, you need to check that the original solution you are using is protected, that you are not infringing on someone else's rights.

A good patent attorney will alert you to the fact that anything not written in the patent documents is not and cannot be protected by the patent. This is very important strategic information. This is because you may knowingly and deliberately work to keep a component that significantly improves the practicability or manufacturability of a solution as know-how that is protected as a trade secret. This makes it difficult for those who would like to use the patent without a license, but leaves room for those who would try to circumvent it. At the same time, you are creating a comprehensive package for the prospective licensee, who, in addition to the patent itself, will receive other useful information that will make it much easier and faster for them to enter the market.

The flip side of the coin is that everything written in the patent documents can and often does limit protection. Anything you mention in any section can cause you to fail to meet the conditions of patentability, or be used by an opponent to try to circumvent or invalidate the patent altogether. More is explained in the chapter 4.2.2.



ÚŘAD PRŮMYSLOVÉHO VLASTNICTVÍ
Antonína Čermáka 2a 160 68 Praha 6
UPV.GOV.CZ

Tel.: 220 383 111 Fax: 224 324 718 E-mail: posta@upv.cz Datová schránka: ix6aa38

PŘIHLÁŠKA VYNÁLEZU
se žádostí o udělení patentu

(Vyplní Úřad)
Pořadové číslo:
Spisová značka přihlášky:
Potvrzení o přijetí vydáno dne:
MPT
Vyřizuje
Kód

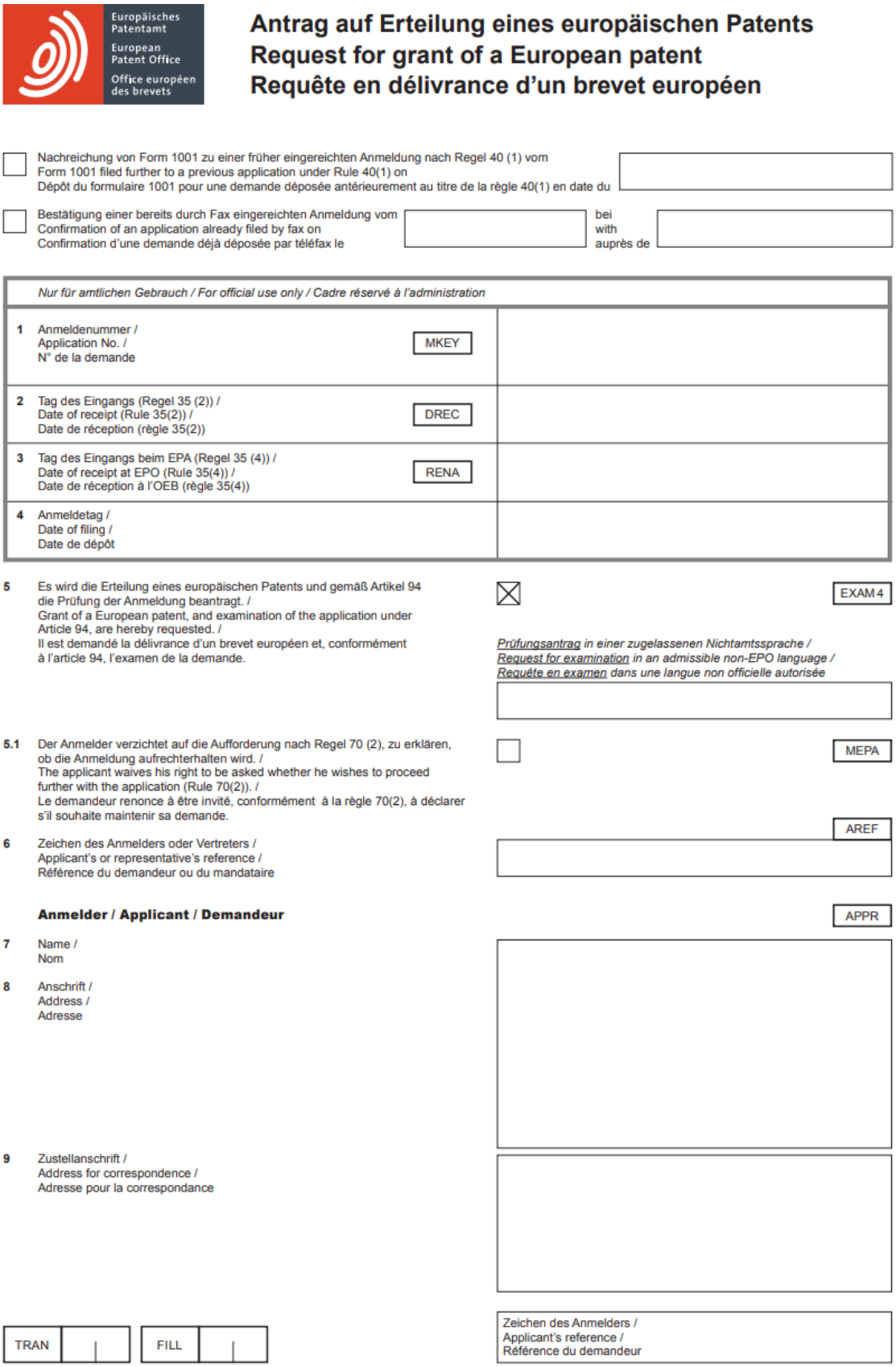
DRUH PŘIHLÁŠKY

Přihláška NÁRODNÍ (Označte křížkem.)		nebo ZAHRANIČNÍ	
Přihláška PCT – národní fáze, číslo přihlášky PCT		Dat. mez. podání:	
Žádost o PŘEMĚNU z EP na přihlášku národní, číslo přihlášky EP		Dat. EP podání:	
Přihláška VYLOUČENÁ z původně podané PV, číslo přihlášky PV			

NÁZEV VYNÁLEZU

POČET PŘIHLAŠOVATELŮ

Figure 9 Example of part of the Czech patent application form for an invention (Industrial Property Office - Invention Application, 2022)



Europäisches Patentamt
European Patent Office
Office européen des brevets

Antrag auf Erteilung eines europäischen Patents
Request for grant of a European patent
Requête en délivrance d'un brevet européen

☐ Nachreichung von Form 1001 zu einer früher eingereichten Anmeldung nach Regel 40 (1) vom
Form 1001 filed further to a previous application under Rule 40(1) on
Dépôt du formulaire 1001 pour une demande déposée antérieurement au titre de la règle 40(1) en date du

☐ Bestätigung einer bereits durch Fax eingereichten Anmeldung vom
Confirmation of an application already filed by fax on
Confirmation d'une demande déjà déposée par téléfax le
bei
with
auprès de

Nur für amtlichen Gebrauch / For official use only / Cadre réservé à l'administration

1 Anmeldenummer / Application No. / N° de la demande	MKEY	
2 Tag des Eingangs (Regel 35 (2)) / Date of receipt (Rule 35(2)) / Date de réception (règle 35(2))	DREC	
3 Tag des Eingangs beim EPA (Regel 35 (4)) / Date of receipt at EPO (Rule 35(4)) / Date de réception à l'OEB (règle 35(4))	RENA	
4 Anmeldetag / Date of filing / Date de dépôt		

5 Es wird die Erteilung eines europäischen Patents und gemäß Artikel 94 die Prüfung der Anmeldung beantragt. /
Grant of a European patent, and examination of the application under Article 94, are hereby requested. /
Il est demandé la délivrance d'un brevet européen et, conformément à l'article 94, l'examen de la demande.
☒ EXAM 4

Prüfungsantrag in einer zugelassenen Nichtamtssprache /
Request for examination in an admissible non-EPO language /
Requête en examen dans une langue non officielle autorisée

5.1 Der Anmelder verzichtet auf die Aufforderung nach Regel 70 (2), zu erklären, ob die Anmeldung aufrechterhalten wird. /
The applicant waives his right to be asked whether he wishes to proceed further with the application (Rule 70(2)). /
Le demandeur renonce à être invité, conformément à la règle 70(2), à déclarer s'il souhaite maintenir sa demande.
☐ MEPA

AREF

6 Zeichen des Anmelders oder Vertreters / Applicant's or representative's reference / Référence du demandeur ou du mandataire

Anmelder / Applicant / Demandeur

APPR

7 Name / Nom

8 Anschrift / Address / Adresse

9 Zustellanschrift / Address for correspondence / Adresse pour la correspondance

TRAN | FILL

Zeichen des Anmelders / Applicant's reference / Référence du demandeur

EPA/EPO/OEB 1001.1 – 03.23

Figure 10 Example of the first page of an invention application to the European Patent Office (Request for grant of a European patent, 2022)

4.1.2 Phase 2 - after filing the patent application

ATTENTION! Once you file a patent application, you cannot add anything to it in terms of scope of protection. At most, you can correct some administrative or formal defects, but the modification of the subject matter is very strict and limited. It is therefore sometimes worth using the time between filing and publication to withdraw a patent application and file a new one. But beware of publication in the interim.

A priority application for an invention may be filed in any country or in certain regional systems. The system may be slightly different in each country, the format of the application, the fees involved, the time limits for the Office's response and yours vary. The number and form of interactions may be limited. A good patent attorney should be able to help you deal with all of this.

In principle, however, you will go through the basic milestones in all countries in a similar way:

1) **Filing a** complete patent application on the prescribed form and in the prescribed manner. The date of filing is absolutely crucial, it is the so-called **priority date from which** all time limits in the course of the proceedings are subsequently calculated.

   This date also fixes the state of the prior art, i.e. the so-called **prior art** = anything disclosed before this date may interfere with the grant of a patent. Whatever has been disclosed will be judged by the conditions of patentability. The tricky thing is that patent documents that were filed before the priority date are also considered, even though they were published after it.

   From this date, the so-called **priority period of 12 months** runs for extending the application abroad. This period is not exceedable. If the patent has not been extended within 12 months, it cannot be valid anywhere else than in the country where it was filed.

2) **Formalities** - the patent attorney should take care of their correctness. There are quite detailed Instructions available from the Czech Industrial Property Office (Kratochvíl, 2022)which should be followed.

3) **The preliminary examination** automatically follows the formalities check and aims to verify that the statutory requirements for the grant of a patent are met (Kačírek, 2018), i.e. that it does not fall within the excluded areas or infringe good morals (§3, §4, §26 and others of the Patent Act (Act No. 121/2000 Coll., the Copyright Act, the Act on Rights Related to Copyright and on Amendments to Certain Acts)).

4) **Publication** after 18 months from the priority date. If something prevents publication, the Office may stop the procedure even before publication. Publication is a condition for the grant of a patent, so it can occur earlier at the request of the applicant.

5) **Full survey** - only initiated on application and subject to a fee. It does not have to be requested right away and sometimes it can make sense. However, it is usually requested immediately upon submission. The maximum time limit for applying for a full survey is 36 months from priority. The duration of a full examination is difficult to predict, the shortest is around 9 months, the average time to final decision is around 2 years, there are known cases where a patent has been pending for 5 years or more. It is then a matter of consideration why this is the case.

   The full examination examines the conditions for patentability, in particular novelty, inventive step and industrial applicability. The output of the full examination is a search report (see also 4.2.3).

   You can define your views on the search report and communication and clarification with the authority and clarification of the scope of protection is ongoing. At this time, the scope of protection may be narrowed by agreement, for example by merging claims (dependent claims become part of independent claims) or limiting categories.

6) **Opposition, comment and other proceedings** may occur after publication or grant of a patent, this is the first stage of litigation where third parties may interfere with the scope of protection of your solution.

7) **The granting and maintenance of a patent involves the** payment of fees. Different in each country and at different times. Sometimes it is paid during the proceedings, sometimes it

is paid after the grant. Usually the fees increase with the length of maintenance, but in each country at a different rate. The Technology Transfer Centre of the Czech Academy of Sciences published an interesting comparison of fees in the most common filing countries in 2022 (Scholzová & Hruška, "Transfer Agent Quick and Easy" series, part 3. rights to results, 2022).

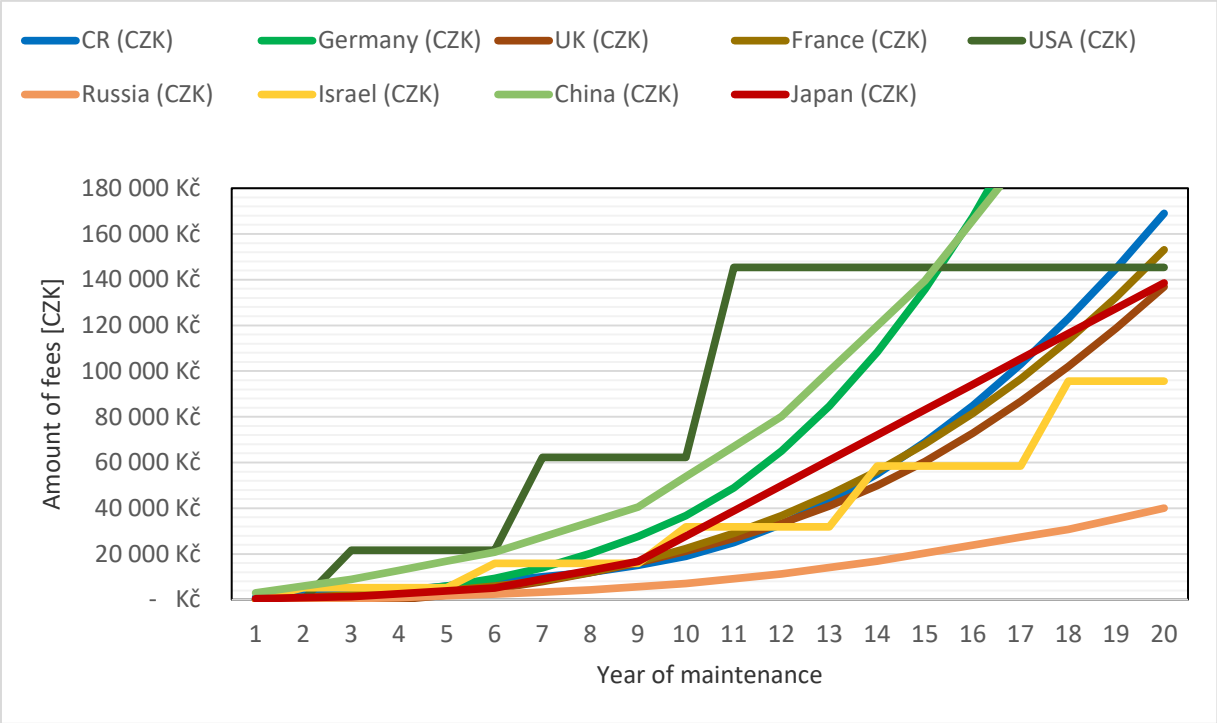


Figure 11 Illustration of the increase in maintenance fees in different countries

4.1.3 Phase 3 - International Expansion

In order to extend the territorial scope of the monopoly right provided by the patent, it is necessary to enter other countries or a regional or international system within **12 months** of priority. The 12-month period from priority, i.e. from the filing of the first patent application for the invention, is not exceedable. Hypothetically, one could play the game of withdrawing an unpublished application and filing a new one, but this game is very risky.

Consider the context and risks that may arise if you withdraw an unpublished patent application and file a new one for the same solution. What can happen?

There are several ways to secure international protection:

- **National route** - is particularly suitable if the future markets or areas of interest consist of only a few selected countries (up to about 4), or if the countries in question are not part of one of the larger systems. In this case, you will use the national patent representation in the selected country and follow the local standard process in each country individually and according to local legislation. You will almost certainly need a local patent attorney and you will also need a translation into the national language. This is very demanding both procedurally and financially. However, you have to take this route if you want protection in, for example, **Argentina or Taiwan** (check the countries currently participating in the PCT system, (Scholz & Hruska, "Transfer Agent Quick and Easy" series, Part 3. rights to results, 2022)).

  You must also continue to the national stages using the PCT system, but usually the local authority will no longer carry out the search itself, but will accept the international one.

- **PCT system** - the most commonly used international application system, which significantly increases the time for deciding on specific markets, covers a significant number of countries and simplifies the subsequent national proceedings. **CAUTION** But this is only an application and after successful proceedings you only have a certificate of patentability not a granted

patent. You must necessarily enter one of the national phases within **30 months** (longer in some cases) of priority.

Very often, when searching, you will find an application with a WO designation, i.e. one that has been filed in the PCT system process, which is not followed by any national patents. Sadly, many inventors and applicants are convinced of the validity of their patents worldwide and do not realize that they have no protection anywhere, except perhaps in their own country. Such applications very often become the subject of so-called patent trolling, and it is very useful to be able to see whether they are even valid in the territory in which the technology is used.

- **Regional systems** - there are a number of regions that have agreed to a common procedure and simplification for applicants who wish to hold monopoly rights in their territory. For us the closest is probably the European Patent System (EPO), but there are others such as Eurasian (EAPO), African Francophone (OAPI), African Anglophone (ARIPO), Gulf Cooperation Council (GCC) and others. In order to use them, it is important to look at the current terms, rules and context in close cooperation with a good patent attorney.

  The European patent is currently (2023) in a phase of dynamic transformation from a single application system validated in individual countries to a Unitary European Patent system. Negotiations are still ongoing, there are several options to enter and exit the system, the rules are not settled. We therefore strongly recommend consulting with a quality patent attorney who keeps up to date with current developments.

It is interesting to look at the cumulative cost of maintaining a patent in each country. The comparison was published in (Scholz & Hruska, "Transfer Agent Quick and Easy" series, Part 3. rights to results, 2022):

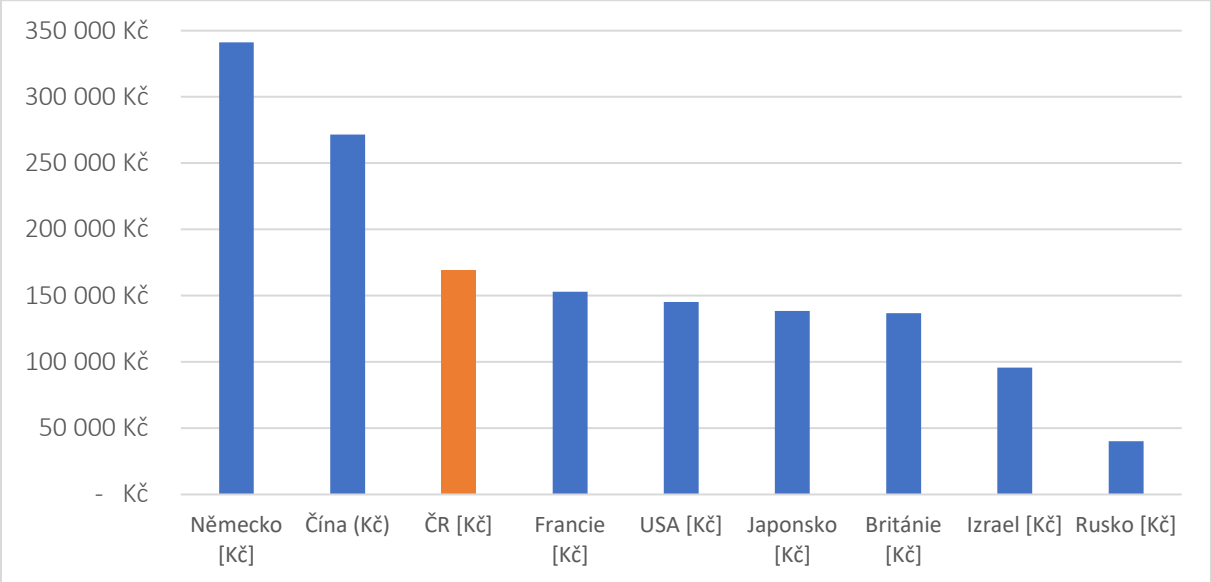


Figure 12 Total amount of maintenance fees paid over 20 years in selected countries

Consider the ratio of the size of the market and its importance compared to the amount of monopoly maintenance fees for a particular product. What is the impact of this ratio on the economy?

4.1.4 Phase 4 - Enforcement

This phase is often neglected in Czech research organizations, there is no money or other resources for it, there are no people to take care of the patent portfolio and monitor its use or abuse. The issue of patent enforcement is also far beyond the scope of this material. Nevertheless, it is important for the technology and knowledge transfer professional to have at least a basic understanding of what patent enforcement is and how to work with it. Very analogous situations can arise in the case of copyright, which often overlaps with industrial rights.

Basic types of intellectual property disputes (source (Chloupek, 2021)) are:

- **Cancellation of the license agreement** = many situations can be dealt with already within the agreed license agreement, for example the risk of damage caused by the implementation of the subject of the license or its insufficient quality. Here we refer to situations where the agreed terms and conditions are violated by our business partner. For example, they may not pay the license fees or deliberately reduce them, they may not respect the scope of the license, they may not respect the quality of the process and thus abuse the reputation of the provider, they may not respect other obligations arising from the license agreement.
- **Infringement of the rights we hold**, which is when someone infringes your rights, for example, by using your technology without having a license agreement to do so.
- **Infringement of others' rights**, where we are accused of abusing the rights of third parties ourselves. Separate business, where there may be so-called patent trolling, but also real situations that our licensing partners may find themselves in.
- **Revocation and restraint efforts** are discussed more fully in the chapter on patent prosecution (4.1.2), where someone tries to limit the scope of protection in order to avoid needing a license to use their own technology or to fit in with their own protection.
- **Disputes over authorship or authorship**, ugly disputes that also occur in the research environment, especially when the result of the research is well commercialized.
- **Exercise of rights to reasonable remuneration of** originators, in particular where rights are sold or the originator has terminated employment with the institution using the rights.

Types of legal proceedings in intellectual property disputes:

- Civil
- Criminal
- Administrative

What can be claimed, for example:

- Abstention and removal of consequences
- Monetary compensation - compensation for damages, fine, additional compensation, reasonable satisfaction
- Withdrawal from the contract, change of the terms of the contract
- Revocation or limitation of a foreign patent

We recommend consulting an experienced law firm to resolve these unpleasant situations. In any case, disputes are an excellent source of experience and lessons for the future. Without them, your knowledge would only be textbook theory.

4.2 Patent documents

The form of patent documents is fairly well harmonized in a significant part of the world. Thanks to international conventions, standard categories and their designations have been introduced, and internationally recognized classifiers are used. So let's take a look at what makes up such a patent document and what can be read from it.

4.2.1 Bibliographic overview

Usually the first page, which is just bursting with information. The individual sections are marked with numbers to help you find your way around, even in a document written in a foreign language and in a different font. When reading this chapter, we recommend that you take at least two different examples of bibliographic pages of patent applications or granted patents and find and compare the information on them - the numerical code indicates the type of information:

INID	Item	Importance and benefit
(10/11)	Document number	An unambiguous document identifier that makes it easy to find. Usually includes the country code and document type (Handbook on industrial property information and documentation, 1997). In some countries, the code includes the year of filing or grant. - This number is used for citations
(13)	Document type	At a glance, you can identify what type of document it is, (KIND Codes, undated): - A1 = published application with search report, A2 = published application without search report; A3 = self-published search report - B1 = Patent file (granted patent); B2 = Amended (modified) patent spin based on opposition proceedings (after litigation)
(19)	Office	Identification of the authority that prepared the document
(21)	Application number	Usable in the same way as the document number. A patent in the sense of the law is usually a set of documents at different stages of the proceedings, based on one or more applications. You can tell by the application number that they are the same patent family.
(22)	Date of submission	An important indication for strategic thinking about the relevance of the document found - see patent prosecution. Also useful for monitoring development trends.
(30)	Priority date	Extremely important date from which all time limits during the patent proceedings are calculated. Key information for protection strategy or use of related solutions: - If you have only found a national patent application that is more than 12 months old and there is no international application for it - at most it will be valid in that country and free to use elsewhere. - If you have found only a PCT application without national offshoots that is older than 36 months from priority - you can rest easy, no rights from this application will apply anymore
(40/43)	Date of publication	A crucial date for assessing your own claimed solution in terms of inventive activity and also for any legal disputes. This is because if you would have independently and demonstrably come up with the same solution before disclosure, you are in a different legal position than if it happens after disclosure. The publication definitively makes the subject matter of the application state of the art. No one will ever be able to claim it as theirs. The date of publication shall be no later than 18 months after the filing of the priority application. Publication is a condition

		for the grant of a patent and can therefore be made earlier on request.
(47)	Date of award	It is only relevant for granted patents, you won't find it on the application. Important date for the legal effects of legal protection to start.
(51/52)	MPT/IPC Resp. CPC	Classification of the subject matter of a patent into so-called patent classes. The classification does not depend on the opinion and position of the applicant; it is carried out by the Office. It is thus one of the few objective clues when you want to search the field - look first for the related classes, then for the content. Absolutely essential for the creation of the industry map. The classification is regularly updated and refined according to the real evolution of technology.
(54)	Solution name	The name of the technical solution being applied for. Different countries have different approaches to naming. You may therefore encounter an all-encompassing one-word name like "Engine" to a very detailed multi-line descriptive name. It is used for basic orientation and can be searched by keywords.
(57)	Annotation/abstract	A short and concise description of the invention, searchable by keywords. The first section you read to evaluate whether it makes sense to study the entire document. Sometimes it is accompanied by a picture (at the examiner's choice), sometimes it is missing altogether.
(71)	Applicant	The person who has asserted the right to the patent is usually the employer of the people who invented the solution. Sometimes the applicant may be the same as the originator, but this is uncommon in today's world. It is used to map important innovative players in the industry - possible competitors or partners for research collaboration. It can be used for an overview of the creative activities of a given entity - an excellent basis for marketing and self-presentation. Beware of misspellings in the names of applicants in other countries Co-applicants may present difficulties/discomfort to a prospective licensee in having to deal with multiple entities.
(72/75)	Originator	A list of persons who have contributed to the creation of the invention by their own creative activity, a list of persons to think about with additional remuneration in case of commercial exploitation. Even in the Czech Republic there are known disputes about authorship - it is not advisable to attribute to the list someone who objectively and demonstrably does not belong there, and on the contrary to omit someone who contributed to the solution, but perhaps did not leave in good faith. The subjects of proof are not easy and certainly not pleasant.

		The number of originators and their credibility in the field can be an indicator of quality for some, but also of the risks associated with the application of the technology.
(73)	Owner	The current holder of the rights to the patent, presumably bought or otherwise acquired the patent from the applicant. Mapping entities that use patents originating at other institutions - a potential partner to license our patent. Map of players in a given market area.
(74)	Representative	A variable that is unstable over time and which may help a little in verifying the credibility and quality of the patent attorney with whom we would like to cooperate. But beware of hasty assessments, just because someone has written a lot of patent applications does not necessarily mean that they are of high quality Not all databases allow analytics by attorney.

PATENTOVÝ SPIS

(11) Číslo dokumentu:
309 224
(13) Druh dokumentu: **B6**
(51) Int. Cl.:

C21D 8/00	(2006.01)
C21D 7/13	(2006.01)
C21D 9/00	(2006.01)

(19) ČESKÁ REPUBLIKA

ÚŘAD PRŮMYSLOVÉHO VLASTNICTVÍ

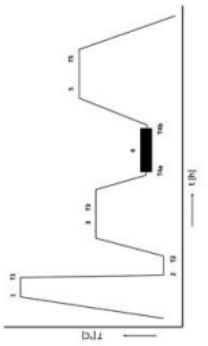
(21) Číslo přihlášky: **2020-675**
(22) Přihlášeno: **14.12.2020**
(40) Zveřejněno: **01.06.2022**
(Věstník č. 22/2022)
(47) Uděleno: **22.04.2022**
(24) Oznámení o udělení ve věstníku: **01.06.2022**
(Věstník č. 22/2022)

(56) Relevantní dokumenty:
(Salvetr P, Nový Z, Gokhman A, Kotous J, Zmeko J, Motyčka P, Dlouhý J." Influence of Si and Cu content on tempering and properties of 54SiCr6 steel. Manufacturing Technology. 2020;20(4): ISSN: 1213-2489; doi: 10.21062/mft.2020.079; https://journalmt.com/pdfs/mft/2020/04/16.pdf) 08.12.2020; (Nicky Kisku: Strengthening of High-Alloy Steel through Innovative Heat Treatment Routes; Welding - Modern Topics;
Edited by Sadek Crisóstomo Absi Alfaro, Wojciech Borek and Blažej Tomiczek; DOI: 10.5772/intechopen.91874; https://www.intechopen.com/books/welding-modern-topics/strengthening-of-high-alloy-steel-through-innovative-heat-treatment-routes) 20.04.2020.
RU 2287592 C1; US 3930907 A; RU 2422541 C1; CN 109128708 A; EP 2562271 A1; CZ 302917 B6.

(73) Majitel patentu:
COMTES FHT a.s., Dobřany, CZ
(72) Původce:
Dr. Ing. Zbyšek Nový, Letiny, CZ
Ing. Jakub Kotous, Blovice, CZ
Ing. Pavel Salvetr, Ph.D., Klatovy, Klatovy IV, CZ
Ing. Petr Motyčka, Plzeň, Bolevec, CZ
(74) Zástupce:
Langrova, s.r.o., Skrétova 1011/48, 301 00 Plzeň, Jižní Předměstí

(54) Název vynálezu:
Způsob tepelného a deformačního zpracování kovového polotovaru

(57) Anotace:
Způsob tepelného a deformačního zpracování kovového polotovaru zahrnuje kalení (1) a na něj přímo nebo s prodlevou navazující první popouštění (3). Dále se nejméně jednou provede na první popouštění (3) navazující sekvence sestávající z plastické deformace (4) pro ovlivnění materiálových vlastností polotovaru a na ni navazujícího dalšího popouštění (5). Teplota (T4a) zpracovávaného polotovaru na počátku plastické deformace (4) může být nižší, rovna, nebo vyšší než teplota (T4b) na konci řečené plastické deformace (4). Teplota (T4a) zpracovávaného polotovaru se může zvýšit deformačním teplem bez dodání tepla z vnějšku. Teplota (T4a) zpracovávaného polotovaru na počátku plastické deformace (4) může být obecně rozdílná od teploty (T2) polotovaru na počátku prvního popouštění (3). Teplota (T2) zpracovávaného polotovaru na počátku prvního popouštění (3) je nižší než teplota konce martenzitické přeměny (Mf) materiálu daného polotovaru. Teplota (T3) prvního popouštění (3) může být odlišná od teploty (T5) dalšího popouštění (5).



CZ 309224 B6

Figure 13 Title bibliographic page of the Czech patent

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
23 June 2022 (23.06.2022)

WIPO | PCT

(10) International Publication Number
WO 2022/127949 A1

(51) International Patent Classification:
C21D 7/13 (2006.01) *C21D 1/25* (2006.01)
B21D 22/00 (2006.01) *C21D 7/10* (2006.01)
C21D 9/48 (2006.01) *C21D 6/04* (2006.01)
C21D 1/18 (2006.01) *C21D 9/02* (2006.01)
C21D 1/26 (2006.01) *C21D 9/52* (2006.01)

(21) International Application Number:
PCT/CZ2021/050149

(22) International Filing Date:
14 December 2021 (14.12.2021)

(25) Filing Language: Czech

(26) Publication Language: English

(30) Priority Data:
PV 2020-675 14 December 2020 (14.12.2020) CZ

(71) Applicant: **COMTES FHT A.S.** [CZ/CZ]; Průmyslová 995, 33441 Dobřany (CZ).

(72) Inventors: **NOVÝ, Zbyšek**; Svárkov 22, 33601 Letiny (CZ). **KOTOUS, Jakub**; Zahradní 660, 33601 Blovice (CZ). **SALVETR, Pavel**; Tyršova 351, 33901 Klatovy (CZ). **MOTYČKA, Petr**; Gerská 1237/14, 32300 Plzeň (CZ).

(74) Agent: **LANGROVA, S.R.O.**; Skrétova 1011/48, 30100 Plzeň (CZ).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO,

(54) **Title:** METHOD OF HEAT AND DEFORMATION TREATMENT OF A METAL SEMI-FINISHED PRODUCT

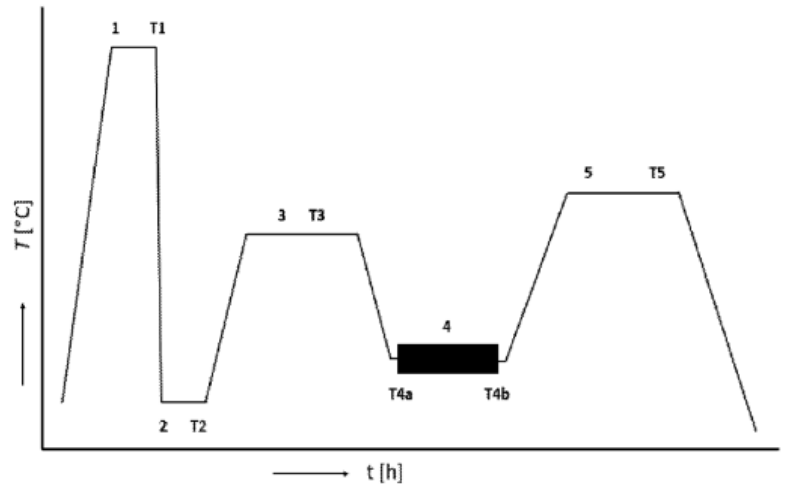


Fig. 1

(57) **Abstract:** The method includes a quenching (1) followed by a first tempering (3) either directly or after a dwell time. Furthermore, a sequence consisting of a plastic deformation (4) is conducted following the first tempering (3) to influence material properties of a semi-finished product and an additional tempering (5) following thereto. The plastic deformation (4) initial temperature (T4a) of the semi-finished product may be lower than, equal to, or higher than said plastic deformation (4) final temperature (T4b). The plastic deformation initial temperature (T4a) may be increased by deformation heat without external heat supply. The plastic deformation (4) initial temperature (T4a) of the semi-finished product being processed may be in general different from the first tempering (3) initial temperature (T2) of the semi-finished product. The first tempering (3) initial temperature (T2) of the semi-finished product being processed is lower than a martensitic transformation finish temperature (Mf) of said semi-finished product. The first tempering (3) temperature (T3) may differ from the additional tempering (5) temperature (T5).

WO 2022/127949 A1

Figure 14 Title bibliographic page of a PCT application for an invention

(19)日本国特許庁(JP)　(12)特　許　公　報(B2)　(11)特許番号

特許第6744915号
(P6744915)

(45)発行日　令和2年8月19日(2020.8.19)　(24)登録日　令和2年8月4日(2020.8.4)

(51)Int.Cl.		F I		
H01S 3/06	(2006.01)	H01S	3/06	
C30B 15/00	(2006.01)	C30B	15/00	Z
C30B 29/28	(2006.01)	C30B	29/28	
H01S 3/113	(2006.01)	H01S	3/113	
H01S 3/10	(2006.01)	H01S	3/10	D

請求項の数 15　(全 12 頁)

(21)出願番号　特願2018-521459(P2018-521459)
(86)(22)出願日　平成28年7月15日(2016.7.15)
(65)公表番号　特表2018-527758(P2018-527758A)
(43)公表日　平成30年9月20日(2018.9.20)
(86)国際出願番号　PCT/CZ2016/050026
(87)国際公開番号　WO2017/008774
(87)国際公開日　平成29年1月19日(2017.1.19)
審査請求日　平成30年3月15日(2018.3.15)
(31)優先権主張番号　PV2015-501
(32)優先日　平成27年7月16日(2015.7.16)
(33)優先権主張国・地域又は機関
チェコ(CZ)

(73)特許権者　518014874
フィジカルニ　ウースタヴ　アーヴェー
チェーエル　ヴェーヴェーイー
FYZIKALNI USTAV AV CR, V. V. I.
チェコ共和国　18221　プラハ　8
ナ　スロヴァンツェ　1999/2
(74)代理人　100073184
弁理士　柳田　征史
(74)代理人　100175042
弁理士　高橋　秀明
(72)発明者　コシェルヤ, ミハル
チェコ共和国　25241　ドルニー　ブルジェジャニ　ザ　ラドニツィー　835

最終頁に続く

(54)【発明の名称】高性能レーザシステムを構成するための光学素子およびその作製

Figure 15 Title bibliographic page of a Japanese patent narrowed down against an application

The bibliography is followed by many pages of patent documents.

4.2.2 Patent documents

Understanding the meaning and purpose of the different parts of the patent documents is important not only for the actual drafting of the patent application, but also for reading foreign patents that are found during the search. They can be divided into three main parts:

- Description of the invention - including several descriptive chapters, more or less useful
- Patent claims - clearly defining the scope of protection of the technology - after the abstract/annotation, this is the second part to read in detail. This is where any potential conflict is hidden.
- Drawings - an optional section that can help with quick understanding and evaluation of relevance.

In greater detail then:

The name of the invention - as mentioned above, national practices vary widely. In some places they will allow a nondescript name like R2D2, in others (e.g. in the Czech Republic) they will force you to create a completely descriptive and long name which is then unusable for any other purpose. To prepare an application, usually something simple is used, a quick acronym so that everyone on the team knows immediately what you are talking about, but preferably so that no one uninitiated can tell.

Field of technology - here you will read a brief description of the field of technology. It is used by the examiner for proper classification. It can help in evaluating relevance for deeper study.

State of the art - there should be a detailed delineation here against the state of the art, this is a strategic area where the applicant is trying to maneuver the examiner into a particular position, it can sometimes be confusing. Competing solutions are cited here, here is the source for the field map.

The essence of the invention - essentially rewritten claims in multiple sentences with more detail, this is a strategic area for litigation and future patent limitations. Here are possible escape routes if you want to circumvent the patent.

Clarification of drawings/drawings - an optional section that helps readers a lot, but doesn't actually affect the scope of protection. If there are a lot of drawings and the applicant is a research institution, probably no one has given much thought to the market potential. If the drawings are missing altogether and the applicant is a company, there is probably a treasure hidden inside (or not).

Examples of implementation - a mandatory and very strategically important part. Here, various and hypothetical implementations are presented and inspiration for verification, improvement, workarounds, but also technical limits and constraints lie here. The examples serve to define the scope of protection in the context of legal disputes.

Industrial applicability - a condition of patentability directly from the law. A short summary of what the invention could be used for. Strategic importance is questionable, if you don't specify something, hypothetically someone else may claim a use for your invention in a particular field. They will still need a license from you. Again, if you list everything, you may be disclosing too much to the competition. In purely formal terms, the examiner is only looking at the availability of resources on the ground (you can't get away with a technology requiring 200g of California in each batch) and whether it fundamentally contradicts the laws of physics (perpetual motion probably won't pass either, many applicants have tried it).

Claims - the most important part of all. They have a clearly defined structure, and independent claims define the broadest possible class that is protected by the patent. You can tell from the wording of the first claim (and other independent claims) what category it covers (subject matter, method, use) and how much it defines itself against competition. The claims are no fun to read, they are crazy sentence constructions using specific verb forms and leave the untrained reader with the feeling that the writer has lost his mind. Some database sources give the structure of the claims - very helpful in orientation.

4.2.3 Research report

At the end of the patent document there is usually a search report. Sometimes it is published separately, sometimes the patent application is published without the search report.

The search report is a carrier of very valuable information, both for the applicant on the further course of the patent proceedings and for the reader. What can be gleaned from it?

A section - a restatement of the patent classification, to which field it relates and to which it is relevant. It indicates in which fields the examiner has searched and against which the application has been compared.

Section C - Documents found that are relevant to the application under consideration. They can be in several categories (see explanations in the sample), but three of them are essential:

- **X** - indicates documents that prove that the invention is not new. This means that each document marked in this way contains, according to the examiner, a complete description of the claimed solution. The more X's found, the worse the situation for defending. If there is an X in the search report and you cannot find a granted patent, you probably failed to guess it.

- **Y** - documents from which, according to the examiner, the claimed invention can be assembled with some expertise. Here you have a much better chance of success in convincing him.
- **A** - indicates documents that you should have correctly listed in the prior art section of the patent documents. They do not compromise the subject matter and scope of protection, but they do illustrate the context. Very useful for the reader.

INTERNATIONAL SEARCH REPORT

International application No
PCT/CZ2016/050026

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01S3/06
ADD. H01S3/16 H01S3/23

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/027943 A1 (TUI LASER AG [DE]; GEIGER STEPHAN [DE]; PASTER MARTIN [DE]; FREER SIEG) 1 April 2004 (2004-04-01)	1-3,7-17
Y	page 2, paragraph 3 - page 8, paragraph 2; figure 1	4-6

Y	BELOUET ET AL: "About the crystalline perfection of Nd-doped YAG single crystals", JOURNAL OF CRYSTAL GROWTH, ELSEVIER, AMSTERDAM, NL, vol. 15, no. 3, 1 August 1972 (1972-08-01) , pages 188-194, XP024429512, ISSN: 0022-0248, DOI: 10.1016/0022-0248(72)90118-2 [retrieved on 1972-08-01] page 188, left-hand column, paragraph 1 - page 194, left-hand column, paragraph 4; figures 4,5	4-6

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 October 2016	04/11/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Laenen, Robert

Form PCT/ISA/210 (second sheet) (April 2005)

Figure 16 Example of the first page of a search report for a PCT application

4.3 Patent searches

It is important to note that the research academic world is used to publishing in the professional or popular literature. There is a very sophisticated system for doing this, with evaluation methodologies attached to it, not only for individuals but also for institutions. Conducting a literature search is a standard part of scholarly work.

In addition, it is important to note that research and development of technical solutions is not only carried out in the academic environment, but also very often (and sometimes dominantly) in the industrial sphere. Industry is not forced to publish in the scientific literature and would probably not be interested in doing so. It has no ambition to be evaluated by scientists, it is all about business. So it only publishes when it wants to secure its monopoly rights, and therefore through the patent literature. It is estimated that up to 4/5 of all technical knowledge of mankind is described in patent documents. Therefore, if the scientific world does not use patents to evaluate the state of knowledge, it ignores most of the information. As a result, this then means that much research is useless, examining what has already been tried (I don't mean those used for verification) and as a result many patent applications are then rejected because they hit novelty.

The third thing to remember is that patent literature has its own specific language and style, it is designed to define rights, and thus must be very to extremely specific even at the cost of low clarity. Moreover, in cases that are of market interest, they are deliberately written to be difficult to find so that competitors do not have easy access to solutions and incentives to circumvent the scope of the patent. Standard terms and phrases are often not used, generalized terms common in the literature are not used, and key words fail.

There are many types of patent searches, depending on the reason for which it is performed and the situation in which we find ourselves. The reason why we conduct a patent search has a major impact on its assignment and evaluation. We can search patents for:

- inspiration or solutions for specific problems,
- partners for collaboration, business, competition or team additions,
- watch for violations of your own rights,
- monitor trends and activity in a specific area of technology,
- portfolio of sectoral activities of individual companies or institutions,
- data for analyses and comparisons of different markets, industries or segments for strategic decisions and much more.

Basic breakdown of patent searches:

- on the state of the art – patentability,
- technological industry survey,
- Patent purity, freedom to operate,
- legal status and patent family,
- name search.

In some cases, it is necessary to take into account the fact that patents are published with a delay of at least 9, but usually 18, months after filing. Unfortunately, the most up-to-date information is not available through patent searches. Therefore, a combination with other searches, e.g. in the literature, on the Internet, in company presentations, is always advisable.

4.3.1 State of the art searches

The most common search that can be commissioned by the Industrial Property Office and is part of a full examination in patent proceedings. It is carried out in order to find out relevant information to our own solution. It can help us in the initial preparatory stages of new projects, to look around

for ready-made solutions that can be used in our own research. Conducting an overview search can be very quick (within hours) and can save quite a lot of time, effort and money.

In a situation where we have in our hands our own research result that we believe deserves patent protection, the result of the search can give us an indication of whether it is patentable at all. That is, whether or not it is new or arises from already published documents. This search is very well done by the Office, so you may sometimes find that it is a waste of work to do it yourself. However, if we want to consider the merits of a solution with all its implications and then decide on patenting, we need to do it earlier. Not to mention the effort and money spent on preparing the patent application. An iterative collaboration between the originator or a well-technologically oriented transfer agent and an experienced searcher is needed for a good evaluation. Together, they gradually refine search queries and follow up on information. Such work can take several days.

4.3.2 Technology Industry Survey - Patent Portfolio

A state-of-the-art review can also help when we need to solve a less important technical problem for our own research, or a problem in a different field than the subject of the research. Solutions are often available on the market, but if we want something highly specific, we can use research to check who understands the problem and could help find a solution. The result of the search can then lead to the establishment of a research collaboration or to the development of a bespoke solution according to our specifications. If the result of the search is negative, it may indicate a hitherto insurmountable technological barrier, which, if detected in time, again saves a considerable amount of time, effort and money and leads to an early change of the project plan rather than at later stages. At the same time, it means a challenge and inspiration to the relevant industry, to which you can cheerfully present an interesting problem to be solved.

Thanks to technology research we can get very good data for our own presentation and marketing. The patent portfolio map shows very well and objectively how innovative and active we are in the field.

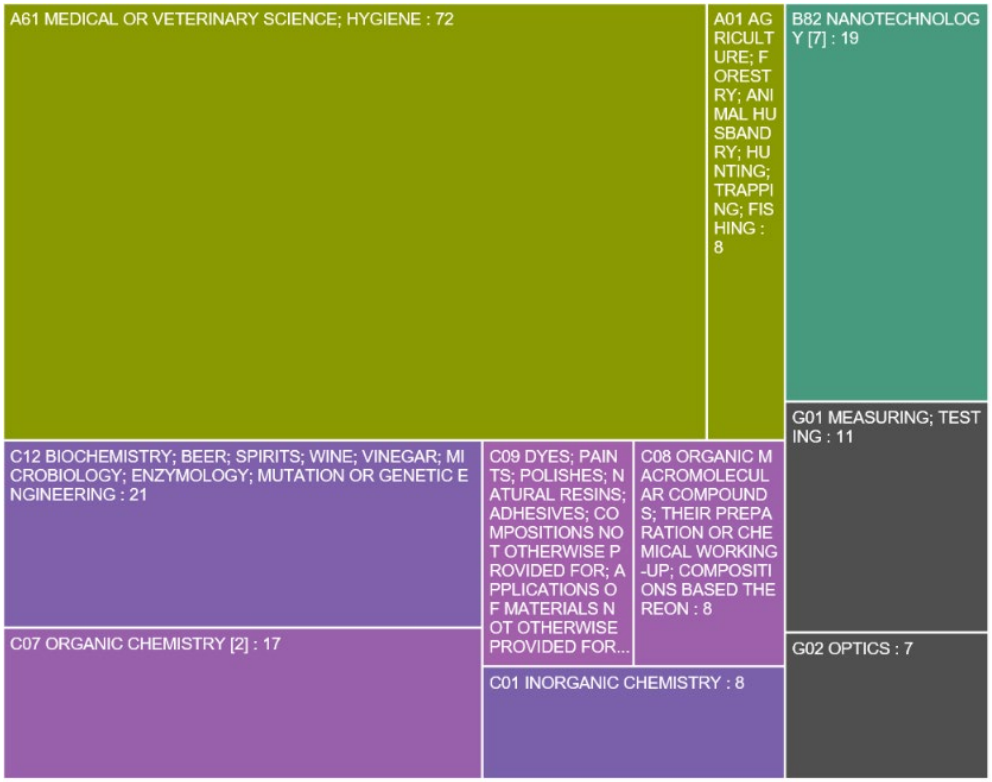


Figure 17 Options for displaying the most used patent classes of a specific research institution [PatSnap]

Industry research can reveal development trends and key players, but also show where the most interesting markets are for a given industry.

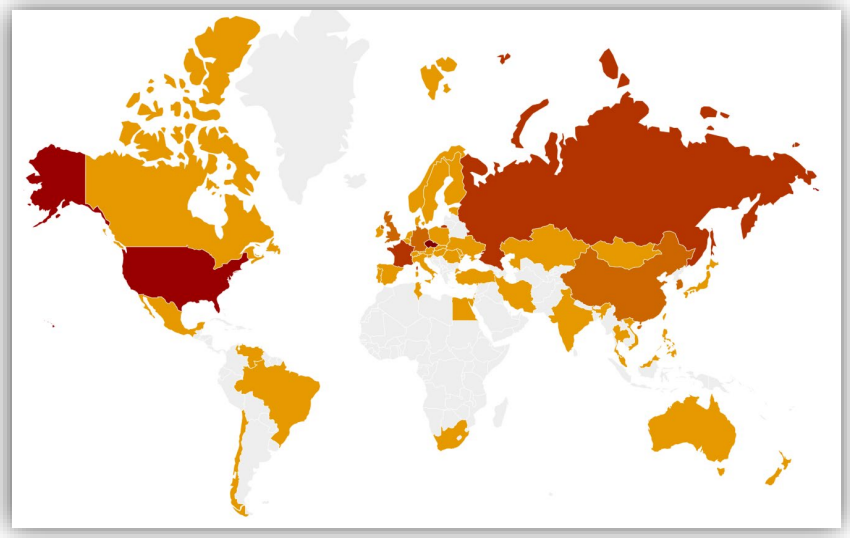


Figure 18 Illustrative sample of countries with the highest number of patent applications in a given field [PatentInspiration]

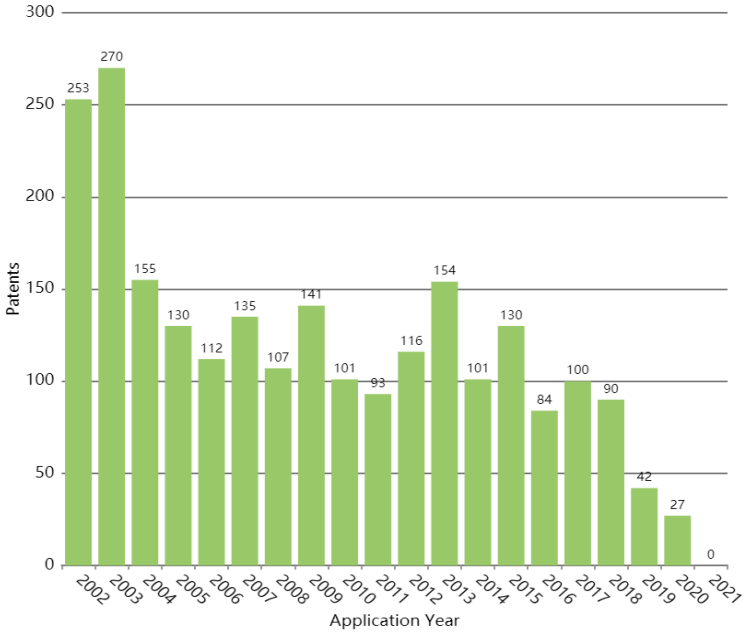


Figure 19 Illustrative example of the number of applications in the selected IPC class

4.3.3 Search for patent purity, freedom to operate

If we are serious about patents, then we must consider that whoever places a product on the market is responsible for its industrial safety. The topic of this chapter is closely related and linked to the chapter on patent enforcement (4.1.4). Firms that have in-house developments carry out this type of search on an ongoing basis for all their products, especially those that they export to foreign markets. In this way, they try to minimize the additional costs of litigating new patents or litigating the infringement of foreign rights.

Several million patent applications are filed worldwide every year. Quite logically, and given the volume, it happens that the development of new products unintentionally infringes the rights of

third parties. Thus, when rights and product meet in the same market, this means significant litigation costs and large losses.

The research environment often pretends that it is not concerned. It takes advantage of its privilege, secured by international conventions, that all knowledge that is publicly available can be used for basic research. But this privilege ends when the research reaches its own result and seeks to apply it in practice. Disappointment can be great when, in the final stages of negotiations or even after a licensing agreement has been concluded, a partner discovers that your solution is not legally free and cannot be used.

Not all patent offices can and do perform this type of patent search. It requires a high level of expertise, professional equipment and cannot be done with freely available databases. The risk of liability for a poor quality search and of recovering additional litigation costs is too high. The evaluation of patent purity is never 100%; the legal status of documents changes and evolves over time. However, a well-conducted search significantly minimizes the risks.

Jan Vondras describes what it takes to conduct a quality patent search (Vondras, 2021): "In order to develop a legal opinion on the patent purity of a product, one needs a detailed understanding of the product itself, the competition, the development direction, and the geographic coverage where the product will be manufactured and sold. After thoroughly familiarizing oneself with the product or its prototype, research is carried out to identify the relevant patent documents. Such a survey usually involves a search of several thousand documents. Specialized professional databases are used to facilitate this difficult task, but the thoroughness of the patent attorney will determine whether or not a relevant document is identified. Once the most relevant documents have been selected, the next step for valid patents is to compare their claims with the technical solutions of the product. The result of the analysis is a legal opinion on whether the product infringes the industrial rights of third parties and, where appropriate, a proposal of possible solutions".

4.3.4 Research on the legal situation and the patent family

It is obvious from its name that it is used to evaluate the territorial and temporal scope of the legal claims of another entity or to verify the current state of validity of the protection of our own solution.

As can be seen from the preceding chapters, in particular on the patent prosecution process (chapter 4.1), the vast majority of technical solutions are not protected by a single document, but are protected by a collection of national or regional patent documents that have been subject to independent proceedings and may have undergone various changes in the scope of protection. Individual documents have come into force at different times and their effectiveness depends on the payment of proper and timely maintenance fees. In some countries there may be litigation or proceedings to narrow or cancel the validity. Sometimes a patent is on a so-called 'standstill' and whether protection will be released or confirmed is not clear.

This task is an integral part of a patent clearance search, but sometimes it makes sense to perform it separately. It is significantly simpler, faster, and in its most basic and simplest form can be handled with freely available databases. Paid search tools allow you to create maps of patent families in a significantly simpler way.

It's useful when we're being attacked for infringing third-party rights as a quick check to make sure we're not trolling, or in situations where we want to verify whether we need a license to use technology in a particular territory.

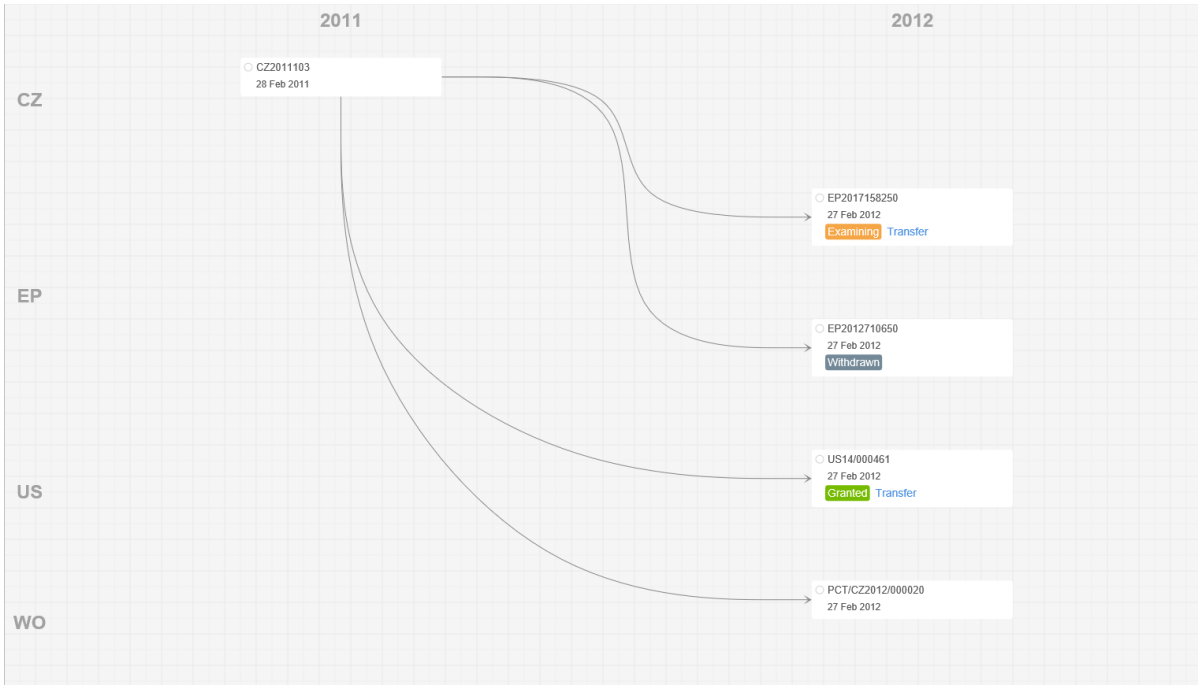


Figure 20 Sample view of patent family and legal status [PatSnap]

4.3.5 Name search

The main search criterion is the name of the originator, applicant or owner of the patent. Sometimes a search by patent attorney may also be useful. The aim may be to check the extent to which the person has industrial rights, their status, how active they are in the field, including the evolution over time, but also whether an employee of the institution is taking technology outside. A name search can also be used to identify key players - competitors or future cooperation partners.

Name searches are usually part of a so-called patent audit, where an institution or company has its patent portfolio analyzed. For a good analysis, it is necessary to use paid patent databases, as it is very difficult to create similar maps manually. However, a quick overview for a single name or company can be done easily and quickly in open sources.

Figure 21 Illustrative sample of the most frequent applicants in a selected IPC class

4.3.6 Search tools

Searching the patent literature requires some experience and knowledge and availability of search tools, strategies and search languages. In principle, three approaches can be used:

- **Publicly available sources** - suitable in all cases where a quick and non-binding overview is sufficient. All transfer staff and, in an ideal world, all researchers should have the skills to work with public sources. Modern tools also work with keywords (albeit in a limited way, for the reasons described above) and try to be as intuitive as possible. A huge amount of useful information can be extracted from them, but analytics is difficult to do with them. Examples of freely available databases:
  - **The IPO database** - https://isdv.upv.cz/webapp/!resdb.pta.frm - maintained by the Czech National Industrial Property Office. The database contains patents and utility models valid in the Czech Republic. It allows reasonably sophisticated searching through a combination of filters, access to individual documents and partially to records of proceedings. It does not contain analytical functions.
  - **ESPACENET** - https://worldwide.espacenet.com/patent/search - managed by the European Patent Office EPO. Advanced search, tracking of patent families and legal status of documents. Extensive tutorials. First choice tool.
  - **PatentScope** - https://patentscope.wipo.int/search/en/search.jsf - a database managed by WIPO, an integral part of the PCT system, contains all patents and applications that have passed through the system. Some basic analysis.
  - **USPTO Patent Public Search** - https://ppubs.uspto.gov/pubwebapp/ - USPTO database. The US system is somewhat specific and also works with so-called provisional applications. The search uses specific logic, we recommend to read the help. The Petapator tool can be used.
  - **National databases in individual countries** - with a bit of effort and using modern translators, it is possible to find a similar database to the Czech IBA in many countries. National offices more or less cooperate with the EPO and WIPO and share some data with them.
  - **GooglePatents** - https://patents.google.com/ - based on full-text search, can also integrate non-patent literature. It has improved significantly over the last few years. Most user-friendly and accessible tool for researchers or people unfamiliar with the specifics of patent literature. Fast, clear, allows simple analysis.
  - **WIPS Global** - https://global.wipscorp.com/page/s0201.php - focused on Asian patents, administered by the Korean Patent Office.
- **Paid professional databases** - they require a trained person who can work with them and extract their huge added value. In an ideal world, there should be at least one such person in every research organization. The added value of paid databases includes corrected errors, secondary classification by industry category, litigation tracking, license sales and value, trend predictions, deep analytics, and a host of others. They represent a very seductive way of life for the enthusiastic analyst. Examples of paid databases with data published in (Scholz & Hruska, The "Transfer Agent Made Easy and Fast" Series, Part 3. Rights to Results, 2022):
  - **PatSnap** - www.patsnap.com - tracks patent prices and litigation. Translations are not machine translations, they correct clerical errors and translations. Daily updated database, many visualizations and analytical tools, makes finished analyses available. Educational materials and training included.
  - **PatentInspiration** - https://www.patentinspiration.com/ - Aesthetic and advanced visualizations of more than 55 types of analysis very easily available. Manual bug fixes, very many tutorials, articles and innovation methods. Connection to TRIZ methodology (for example in (TRIZ methodology - creating and solving innovation to invention assignments, 2023)).
  - **Derwent Innovation** - https://clarivate.com/products/ip-intelligence/patent-intelligence-software/derwent-innovation/ - integrates dozens of sources of non-

patent literature and is used by patent offices for complete research. It uses artificial intelligence tools for searching. Updates daily, manual correction of erroneous data.

    - **Questel** - Questel - Intellectual Property, Innovation and Legal Management - updated daily, tracks royalties

- **Commissioned searches** at the office or patent attorney - these are excellent for regular monitoring of the situation in a particular field or with a particular group of applicants or originators. They are key, but specific, when searches for patent clearance are needed. A well-crafted assignment and the quality of the searcher are important in a custom search, ideally if a joint iteration of the search and search query specification can be arranged. Otherwise, you may receive thousands of documents as a result of the search that are not humanly possible to process. Also ask for guarantees when ordering a search.

5 Commercialisation of results

Knowledge transfer clearly contributes to a deeper integration of the academic and commercial spheres, i.e. these two worlds, and this process helps to increase the application of research results in the commercial world. In this context, it is often said that it increases the competitiveness of regions/states or other territorial administrative units, which leads to longer-term sustainable development.

In connection with the currently more and more used term knowledge transfer, we must emphasize that it is not only and exclusively about R&D results subject to industrial legal protection, but it is also more and more about results generated by other fields, mostly in the humanities and social sciences. These results subject to copyright protection can also be licensed or commercialized in other ways (know-how, written studies, etc.).

In professional practice, it is stated that Technology/Knowledge Transfer includes a set of sophisticated and professional activities, i.e. the whole range of activities from the identification of the result itself, to its protection, to the handling of this result, to its verification and subsequent application in practice itself. Institutions seeking to establish themselves in this field either use specialized external agencies or set up their own internal departments within the company or institution, called technology transfer offices.

Change in the statute of universities in connection with the new Higher Education Act - the status of universities as public institutions. Universities become the owners of unique knowledge created on the basis of state and European financial support, and the possibility of their commercialization (level playing field) has opened up. Increased emphasis on scientific, research and development activities and the development of cooperation with the business sector (Pillar 3). Last but not least, a significant milestone in the Czech environment is the Innovation Policy of the Czech Republic, approved and presented in 2019, which has not been present in our country before. Knowledge transfer has thus gained anchorage in three of its nine pillars.

In this context, I would like to mention the important factors for successful knowledge transfer, which include, first of all, the interest in mutual cooperation, the mutual benefit of the relationship, responsible experts in the field, a clearly defined goal/problem, the establishment of realistic delivery times, the creation and conclusion of a clear and balanced contract and, last but not least, the support of the research organization.

Effective cooperation between research and application depends on the ability to link the interests of the partners. It is essential that both parties involved have a good understanding of what they can offer to the other party in a joint collaboration and what they require from the other party in the collaboration. Successful cooperation between research and applications depends to a large extent on open discussions, thereby building the relationship of trust that is a prerequisite for higher forms of knowledge transfer.

There are several forms of commercialization of R&D results and it is always necessary to choose the appropriate form for a given situation with discretion.

An overview of the forms that can be chosen for the commercialization of intellectual property results:

- sale of rights, for example, patents, utility model, industrial design, trademark,
- Intellectual Property Licensing Agreement,
- contract for work,
- establishing companies to start up and spin off.

The commercialization process is generally defined as the process of turning an idea into commercial products or services. For most scientific research institutions, this means commercially developing the intellectual property (IP) that has been created as part of the research, with the aim of producing successful commercial outcomes that have a positive impact for wider application in society. This is usually achieved through commercial licensing of the IP to an existing commercial

organization or the creation of a new spin-off company to ensure the distribution of new products or services to the market, etc.

From the point of view of the current activities of the JU KTT, we can state that within the framework of intersectoral cooperation and knowledge/technology transfer, the following activities are being implemented:

- Research conducted in collaboration with application partners. This is especially research where the application partner is known in advance, is interested in the future results and actively collaborates on them. These research activities are mainly funded by the application partner.
- Consultancy, expert activities. It is mostly carried out on request by the application sphere, e.g. state administration. These are R&D results that have been produced over several years of research.
- Applying the results of independent research in practice. This is the area of knowledge/technology transfer. Such R&D results usually arise in the framework of independent research or PoC activities and the application partner is not known in advance and must be found in a suitable way. The rights are usually granted in the form of a licensing agreement, establishment of a start-up or spin-off company, etc.
- Knowledge mobility in the form of staff intersectoral mobility. This is where the application partner acquires skilled staff in addition to the results of the joint project. Most of the mobilities so far are between research institutions and a smaller part of the mobilities are with the application sector.

5.1 Before the start - NDA, MTA

Confidentiality and protection of information is thoroughly addressed in the chapter 2.3. At this point, let us recall the context when entering into research or project cooperation or business dealings with other entities. It is already quite common that if the other party has interesting know-how or other added value, it will submit a proposal for a non-disclosure agreement (NDA) or a confidential disclosure agreement (CDA) when preparing the cooperation. If the cooperation involves the exchange and handling of material samples, an MTA (Material Transfer Agreement) is appropriate.

From the perspective of knowledge and technology transfer, it is crucial to realize that although they usually represent public universities or public research institutions, which are largely funded by the state budget, this does not mean that their information is necessarily free and available to all. Where the information has commercial potential, it is entirely appropriate that the HEI or HEI should also behave **with due care** and protect its information for future appreciation. Very closely related to this is the prohibition of **unlawful public aid to** undertakings, which is monitored quite closely by the European Commission.

5.1.1 NDA - Non Disclosure Agreement

How information can be protected is described above. You will necessarily need to include in the mutual confidentiality agreement a precise definition of what the agreement covers. After all, different parts of a research institution may be talking to the same partner quite independently, and there may be collaboration on several concurrent or follow-on projects with different groups and under very different arrangements. A generic NDA covering all collaborations with a given partner is unsustainable. Always consider the reason why such an agreement is being entered into and try to make assumptions about, for example, the obligation to publish contracts in the Contracts Register, or about a future license or exploitation agreement.

The second important task will be to clearly define whether and which commitments are unilateral and which are bilateral. If the NDA is submitted by a commercial entity, it can be assumed that it was drafted by its lawyers who are primarily defending its interests. It is imperative to ensure that the agreement is balanced and protects value on both sides.

BEWARE of the "but the lawyers saw/prepared it" argument! The purpose of the legal profession is to defend the interests of those who pay them, not general utility and moral principles. ALWAYS when you enter into an NDA verify that the contract is mutually balanced.

Precise definition of confidential information - It is necessary to define very clearly what confidentiality applies to - whether to a specific set of information and data, to the prices and conditions of cooperation, to the duration of cooperation, perhaps even to information about ongoing cooperation, including its subject matter. You can make use of existing registers of know-how if available: technical, economic, operational, production or other facts and information of a legal, marketing nature that are not commonly available and generally known, information on relations with clients, business partners, employment law matters, etc. Information from pending and unpublished applications for inventions (patent applications), industrial designs, utility models and other industrial rights...)

It is generally not recommended to write into the contract that everything you ask for is protected, such wording is too vague and unenforceable.

It is also a good idea to define what information is not considered confidential. For example, that which has become public knowledge or publicly available, except where that information has become public knowledge or publicly available as a result of a breach of contractual obligations. Or which was already known to the other Party before the conclusion of the contract, provided that it can prove this fact.

Define how you will protect confidential information and confidentiality obligations - describe in the contract the form in which you will share information and how each party may treat it. Will you use password-protected shared storage? Will you share information on paper or other physical media? Will anyone need to archive it? Will you need to make them available for inspection by the provider? Are they subject to a specific regime? Are both parties eligible to do so? Does the confidentiality obligation apply only to published publications or also to verbal statements in an informal context? Are there any minimum standards of security to be observed?

Adjust rules for publishing the results of the collaboration, such as timely approval and review processes.

Identification of the persons to whom confidential information will be disclosed - an absolutely crucial issue, without which the NDA is essentially meaningless. Establish a list of persons who are eligible to see and handle each level of information. When you make a copy of an information source, indicate on the list who the information is for and have them sign for it. Of course, everyone on the list needs to know about it and preferably acknowledge with their signature that they are a party to the agreement. This will ensure that they are aware of the duty of confidentiality and you can then hold them accountable. If you bind someone without their knowledge and the information reaches them without being marked, it is hard to prevent disclosure and recover compensation afterwards.

Duration of confidentiality - sometimes corporate partners would like a commitment forever, which can sometimes and for some information make good sense, but it certainly won't apply to everyone. Establish reasonable milestones and commitment durations. Even super-secret intelligence archives will sometimes open up.

Sanctions for breach of confidentiality - it is sometimes said that the NDA is essentially unenforceable as a contract and that sanctions are therefore meaningless. However, practical experience shows that an NDA without penalties has no effect. There is a bit of psychology at work here for those involved. The severity of the penalty suggests that you are serious about secrecy. You could even say that without a penalty you are not fulfilling one of the conditions of a trade secret and at that point it would cease to be one. You certainly don't want that.

The amount of the contractual penalty should be proportionate to the nature of the confidential information. The law says that if a contractual penalty is agreed, you automatically lose your right to compensation. However, you can exclude this in the contract and retain the ability to claim both the penalty and any damages incurred.

5.1.2 MTA - Material transfer agreement

A contract that should always accompany any collaboration in which samples or tangible research results are exchanged and can be expected to be the subject of further research. By concluding this contract, future disputes or disillusionment when new potential for exploitation is discovered can be avoided. The MTA may contain provisions towards future licensing.

Very similarly to other contracts, this contract also has typical requirements:

- object and purpose of MTA protection,
- precise definition of the material to be transferred,
- definition of the uses of the material,
- disclaimer of liability for defects and damage caused by the material,
- protection of information,
- options and background protection.

5.2 License Agreement

A license agreement is a type of contract regulated by the Civil Code 89/2012 Coll., as amended, under which the provider, who is the owner of the intellectual property right in question, grants the right to exercise that right to the acquirer, who undertakes to provide remuneration to the provider.

For intellectual property rights which have a personality basis (the author's right to his copyright work and the performer's right to his artistic performance) and which for this reason cannot be validly transferred, the option of a license is the only permissible way.

A license agreement is essentially a fee-based type of contract, which means that the provider is entitled to remuneration upon conclusion of the agreement. The remuneration may also be non-monetary, the contract is then in the nature of a barter contract.

If the remuneration is agreed on the basis of the annual revenue from the use of the license, the licensee is legally obliged to allow the licensor to consult the books of account or other similar documentation in order to check the revenue realized. In the case of works of authorship and artistic performances, the author and the performer shall be entitled to an additional remuneration provided that the remuneration is not agreed as revenue-generating and is so low as to be manifestly disproportionate to the profit derived from the exploitation of the license and the importance of the subject matter of the license for the achievement of such profit. Neither the author nor the performer may waive the right to additional remuneration.

The license can be negotiated to different extents and for different uses.

The license can be divided into two basic groups: exclusive (exclusive) and non-exclusive (non-exclusive). An exclusive license means that the subject matter subject to the contract can no longer be provided by the provider to another person. A non-exclusive license means that the provider can enter into more than one contractual relationship. In practice, the business strategy of the provider or the economic strength of the contracting parties is often decisive. At the same time, the scope of the license itself may be limited or unlimited and may be expressed in particular in terms of time, place or quantity.

"The scope of the license must be agreed in the license agreement and the amount of the remuneration to be paid by the acquirer for the license must be agreed, or the parties' negotiations on the conclusion of the agreement must show their intention to conclude a fee-based agreement without specifying the amount of the remuneration (in such a case, the acquirer shall pay the licensor the remuneration in the amount that is customary at the time of conclusion of the agreement under similar contractual conditions). If the license agreement is to be gratuitous, it must expressly state so, under penalty of invalidity." (Košík, 2014)

For rights protected by copyright law, there are statutory presumptions as to the scope of the license unless the scope is clearly specified. The territorial scope is limited to the territory of the

Czech Republic, the temporal scope is determined by the time period customary for the given work with a limit of one year from the granting of the license, or the delivery of the work, and the quantitative scope is limited to the quantity customary for the given type of (copyright) work and method of use.

Finally, it should be noted that the written form of the license agreement is always required for industrial law protection. For knowledge/innovation falling under copyright protection, a generalization is required by law. At the same time, a written form is also always required for exclusive licenses, regardless of the type of protection. However, it should be noted that if the obligation to publish the contract in the Register of Contracts arises, then the written form is required.

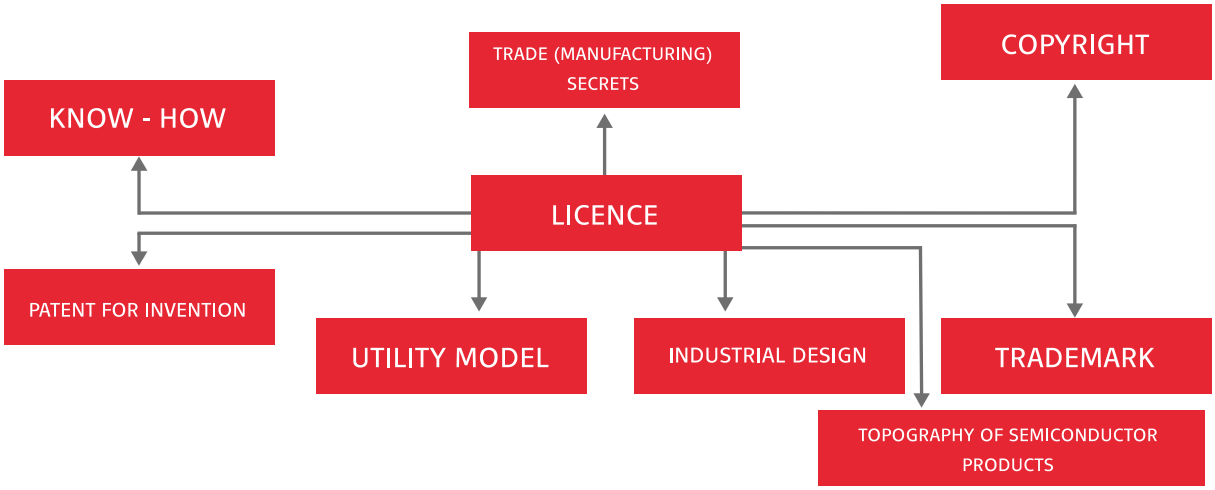


Figure 22 Graphical representation of the requirement for a written version of the license agreement

Sublicensing Agreement

A sub-license means that it is possible to grant the authorization forming part of the concluded license relationship in whole or in part to a third party, but only if this has been agreed in the license agreement! Similarly, under (Act No. 89/2012 Coll., Civil Code) § 2364, the assignee may assign the license in whole or in part to a third party only with the consent of the licensor. However, this consent requires a written form. In the case of sublicensing, it is important to note that the so-called Roman law principle applies that no one can transfer more rights to another than he himself has. That is, no more rights can be transferred than have been obtained from the provider.

Accordingly, any sub-license must be part of the license agreement, but this certainly does not mean that the authorization to sub-license cannot be made by an amendment to the agreement. In this respect, however, it is a good idea to take into account the possibility of sublicensing when concluding the license agreement and, in our experience, it should be noted that this is the case in many cases. As regards the grant of a sub-license, it is possible to consent to the grant of a sub-license but to limit one's consent. Further sub-licenses cannot then be granted by this provision. Nor is it necessary to explicitly state in the license agreement that sub-licenses are prohibited. Section 2363 of the Civil Code is mandatory and cannot be derogated from. As in any other contractual relationship, brevity and, as far as possible, maximum conciseness are appropriate in a license agreement.

5.3 Spin-off

By spin-off we generally mean a business entity that is established to commercialize intellectual property created at a research institution. The intention is therefore primarily to commercialize R&D results and transfer them into practice. Typically, the research institution puts its own intellectual property into the start-up and thus acquires a stake in it. One other option is to insert the

intellectual property into the enterprise in the form of a license or transfer of property rights to the results. The licensed or transferred rights are either contributed to the share capital of the spin-off company or are granted outside the share capital.

Spin offs have become an economic phenomenon in recent years and a tool that seeks to establish the R&D result and monetize it in the early stages (Bjornali & Aspelund, 2012), (Abarbanell, Bushee, & Smith Raedy, 2003). Spin-off is the creation of a new company or organization to benefit from the results of academic research (Blair & Hitchens, 2018). Universities are also institutions that bring new ideas and technologies into business through the establishment of spin-offs, which have been established as a so-called important key element in the entrepreneurial ecosystem (Schillo, 2016). For this reason, the term spin-off development refers to a so-called newly formed company based on the findings of members of a research group from a university that becomes part of a company or organization (De Cleyn & Braet, 2007). It should be emphasized that SMEs are of great importance in most sectors of the world economy, especially in the structures of developed countries (Rowley, Baregheh, & Sambrook, 2011). Thus, we can clearly state that academic spin-off is one of the important tools for the dissemination of knowledge and innovation from the environment of scientific research institutions towards the society. This develops the potential for job creation and further economic growth (Hayter, 2013) and, last but not least, an increase in competitiveness.

(Kliman, 2020) defines the concept of spin-off for the academic environment as a legal entity (usually a legal person or organizational entity regardless of the legal form and designation - spin-off, spin-out, start-up) established for the purpose of commercialization of the results of scientific work by a public research organization or for the purpose of other forms of transfer of the result of the research organization into practice.

(Kliman, 2020) further states that companies established directly by a research organization or by its employees (with the knowledge of the research organization) for the purpose of providing research services, especially if the know-how of the research organization or the specific skills of its employees acquired during research and development activities are used for these services, can also be described as a special form of spin-off.

A spin-off company uses the intellectual property of a research organization to further develop it to the stage of a marketable product or service and all business activities related to its commercialization or other transfer of knowledge into practice are usually transferred to it. Compared to other knowledge transfer transactions, the establishment of a spin-off company can be a relatively more demanding process in terms of time, administration and capital (costs). On the other hand, commercialization of intellectual property (knowledge transfer) through a spin-off company may be more efficient and yield greater financial gain or other economic benefits than commercialization (knowledge transfer) through licensing or transfer of intellectual property.

Figure 23 General reasons for setting up spin-off companies

It can be concluded that it is usually advisable to establish a spin-off company at an early stage of intellectual property development, most often in the following cases:

- relatively easy entry into the existing market,
- the technology has several applications,
- there is a portfolio of patents,
- to achieve relevant market entry, additional investment is needed, the technology still needs to be adapted into a marketable product,
- there is a high probability of getting an investor for the project,
- the motivation of the originator/group of originators to set up the spin-off company is clear,
- the method of return of capital (exit) for investors and the research organization can be defined,
- the technology is of such a nature that there is no existing market for it and no takers can be found to grant a license,
- the spin-off company is a tool to overcome market obstacles.

In view of the above, it is clear that a spin-off company is one of the forms of using the results of research and development and in practice it is usually created by "spinning off" from a research organization.

The general reasons for establishing a spin-off company generally include:

- developing the project small, increases the chances of achieving the expected results,
- taking business risks outside the research institution,
- securing an additional source of funding for the research organization in the event of successful commercialization,
- pooling of funding (raising additional funds),
- marketing reasons,
- increasing the prestige of the university or academia,
- legitimization (confirmation of the meaningfulness, social benefit) of the activities of research organizations.

In summary, the university gains the background and resources to develop the project, while the risk of business failure is transferred to the newly formed company. In the event of success, the research organization itself also gains in prestige. If commercialization is successful, the research organization also benefits financially.

Important milestones for the actual decision on whether or not to establish a spin-off company include the purpose and objective of establishing such a company. Another aspect is the actual participation of the scientific research organization in the spin-off company and, last but not least, its legal form.

The creation of a spin-off company may be initiated by a research organization or another legal entity controlled by it. An employee or student of the research organization may initiate the creation of a spin-off company or, conversely, the impetus for the creation may be given by another legal entity controlled by the employee to exploit and develop the intellectual property.

The types of academic spin-off companies are distinguished according to the purpose for which they were established - i.e. primarily the use of technology or knowledge created at the academic institution (production, operation, service), including the necessary retrofitting. Another purpose may be to provide a service for the academic institution or to buy the products of the academic institution. Last but not least, an important purpose is to find a partner for application projects.

In the case of an agreement with an investor to proceed and establish a spin-off company, an agreement is needed in terms of the ownership share, whether the know-how of the academic institution will be contributed through a license or whether the know-how will be disposed of in another way, for example by transferring property rights. Property or usage rights may be

transferred to the spin-off by contribution to the underlying legal entity or by contractual arrangement. Last but not least, in the context of establishing a spin-off company, it is necessary to address the employment and legal aspects of employees, students and other staff and clarify their further role, both with the existing employer, i.e. the academic institution, and within the company being established.

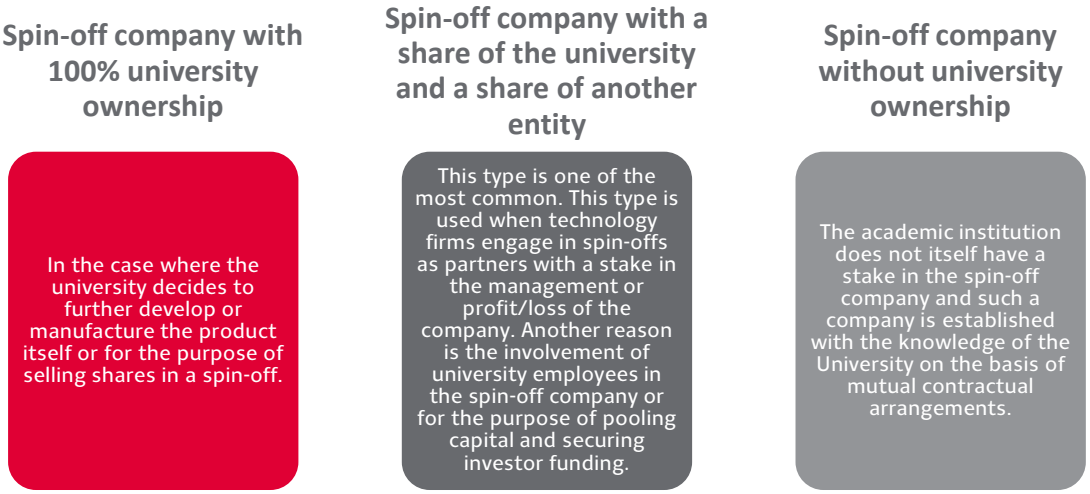


Figure 24 Basic types of spin-off companies

The general financing structure of spin-off companies usually consists of the following sources:

- cash or in-kind contribution (share capital of the spin-off company),
- from own resources of the emerging company (venture capital, grant or project funds, equity, etc.),
- by making a cash or non-cash contribution outside the company's share capital,
- by raising capital for a spin-off company,
- by providing a financial loan,
- by drawing on a consideration, e.g. a service.

In terms of the assessment and subsequent implementation of the project, the expected benefits for the academic institution such as the financial return, the verification and subsequent implementation of the technology into practice, the possible subsequent impact on research and development and the increase in prestige of not only the R&D result but also the academic institution itself should be particularly reflected. Motivation of employees is also an important aspect.

Certain pitfalls and risks certainly include transaction costs, risks arising from applicable legislative norms, e.g. public support, certain pitfalls of conflict of interest of employees operating in both entities or lack of awareness of the potential and benefits of commercialization through the establishment of spin-off companies and the associated general confidence in the results of academic institutions.

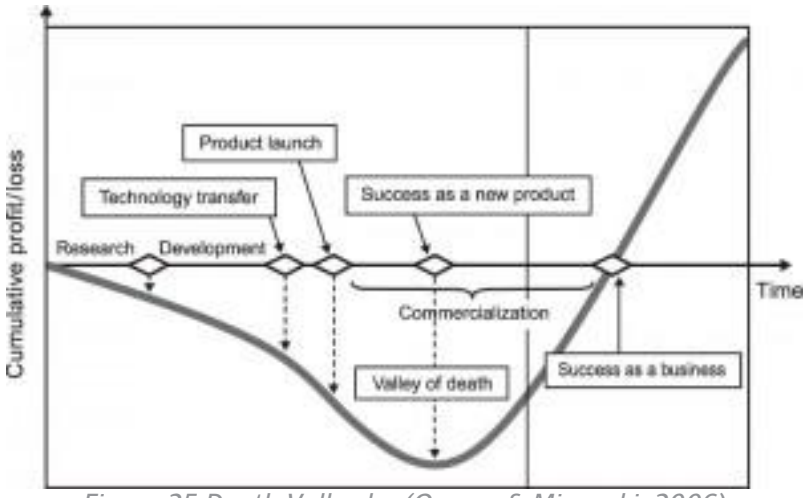


Figure 25 Death Valley by (Osawa & Miyazaki, 2006)

The "valley of death" is a common term in the startup world, referring to the difficulty of covering negative cash flow in the early stages of a startup before its new product or service starts generating revenue from actual customers. I often get questions about real alternatives to bridge this valley, and there are several good ones that I'll outline here. According to the study (Gompers & Lerner, 2001) the problem is very real, 90% of new businesses that do not attract investors fail within the first three years. It is increasingly clear that the problem is that investors require a proven business model, ready for future growth and expansion, before deciding on a potential investment.

It is always advisable to have available financial resources before starting a company. When planning a business, certain financial resources always reduce risks. It is ideal to have the necessary resources planned within the business model to cover the costs required to get to the revenue stage. However, self-funding or bootstrapping (a situation where an entrepreneur is starting a company with little capital and relying on money other than outside investment) is still the most common and safest approach for start-ups.

Another possible solution is to use crowdfunding or apply for competitions and business grants, projects to support developing and start-up companies. The upside of these is that you are not giving up any equity, and their support extends to the early stages of a startup. However, the fact is that obtaining them takes time and a lot of effort.

A very helpful tool to grow a newly founded company is to be involved in a startup incubator, which provides equity funding to nurture young companies and help them survive and grow during the start-up period when they are most vulnerable. These resources often include a cash investment, as well as the opportunity to use office space or mentoring.

An important factor that can significantly influence the development of a newly established firm is the degree of linkage to the innovation ecosystem, particularly to regional innovation centers and their potential role in the start-up support system. This is support that emphasizes all stages leading to a start-up/spin-off firm. It is therefore a classical concept that emphasizes all stages of emergence and transition (incubation and acceleration phases): from an 'entrepreneurial' idea, located in academia, to an existing firm.

In terms of broader support for the establishment of start-up or spin-off companies, the first and foremost need is to develop interest and competences in entrepreneurship and entrepreneurship among students and employees of university and academic organizations. Furthermore, there is a need to provide and create opportunities for direct financial and expert support to those interested in setting up such a company prior to the actual start-up. Provide legal and financial support to selected mechanisms of public universities designed to increase the volume and effectiveness of commercialization activities. Last but not least, to expand the use of the European Investment Fund instruments and at the same time to use investment schemes according to international proven and tested models.

It is evident that support for the creation of (academic) spin-off companies is a trend within Europe and foreign experience shows that this is a really effective and functional tool (HTGF, bpiFrance - Deeptech programme, AWS). Even very prestigious grants like EIC Accelerator already include a combination of grant and investment (in a share in a spin-off) and this will probably be transferred to us sooner or later (the question of implementation to make it functional for academic spin-offs will be crucial).

5.3.1 The process of establishing spin-off companies at the University of South Bohemia

In general, a contract must be concluded with each legal entity that is to become a spin-off company of the University of České Budějovice, which will, among other things, allow it to use the designation "spin-off company of the University of South Bohemia in České Budějovice" or another negotiated and approved designation.

A necessary condition for the conclusion of the agreement under the previous paragraph is the approval of the proposal for granting the status of a spin-off company to the USB. The purpose of approving this proposal is to carefully consider the potential consequences for the management and reputation of the USB that could result from granting the status of a spin-off company to a given legal entity. The proposal for granting spin-off status to a USB spin-off company is prepared by the proposer (i.e. the Bursar or Dean) in cooperation with the Technology Transfer Office. This proposal is approved by the Rector of the USB, to whom it is submitted by the proposer.

The proposal for granting the status of a JU spin-off company must contain in particular the following elements:

- designation and description of the subject of JU intellectual property to be commercialized (transferred into practice) through the legal entity,
- a summary of the expected revenues (or other economic benefits) and their comparison with other forms of commercialization,
- feasibility studies,
- a business purpose of a legal entity or other non-commercial activity,
- analysis of the property structure of the legal entity,
- information on the previous economic activities of the legal entity (if it already exists),
- information on persons who are or are to be members of the statutory body (in particular information on previous business and criminal record) or other bodies of the legal entity,
- proposal for the regulation of contractual relations between the USB and the spin-off company (e.g. cooperation agreement, license agreement, etc.),
- a draft contract under which the spin-off company will commercialize the subject of the USB intellectual property (or put such subject into practice in another way).

The actual approval of the proposal for the establishment of a legal entity takes place as follows.

- If the Rector expresses his/her approval of the Proposal, the Proposal is submitted to the Academic Senate of the USB and the Administrative Board of the USB, whereupon the Rector decides on the establishment of a legal entity, on the acquisition of participation in a legal entity, or on the insertion of a contribution into a legal entity in accordance with the discussed Proposal.
- The Rector then authorizes the KTT to perform all necessary acts for the establishment of the legal entity and its registration in the relevant public register or similar official register.
- From the point of view of the actual implementation of the entry into the legal entity, the value of the contribution in kind must be stated in the founding legal act within the meaning of Section 122 of the Civil Code, by which the USB establishes or co-founded the legal entity, or in any other legal act, on the basis of which the JU is obliged to make a contribution to the legal entity, unless otherwise provided for by applicable legislation. A non-cash contribution to a company shall be valued in the manner specified in the statutes or, on the formation of a cooperative, in the manner agreed by all members.

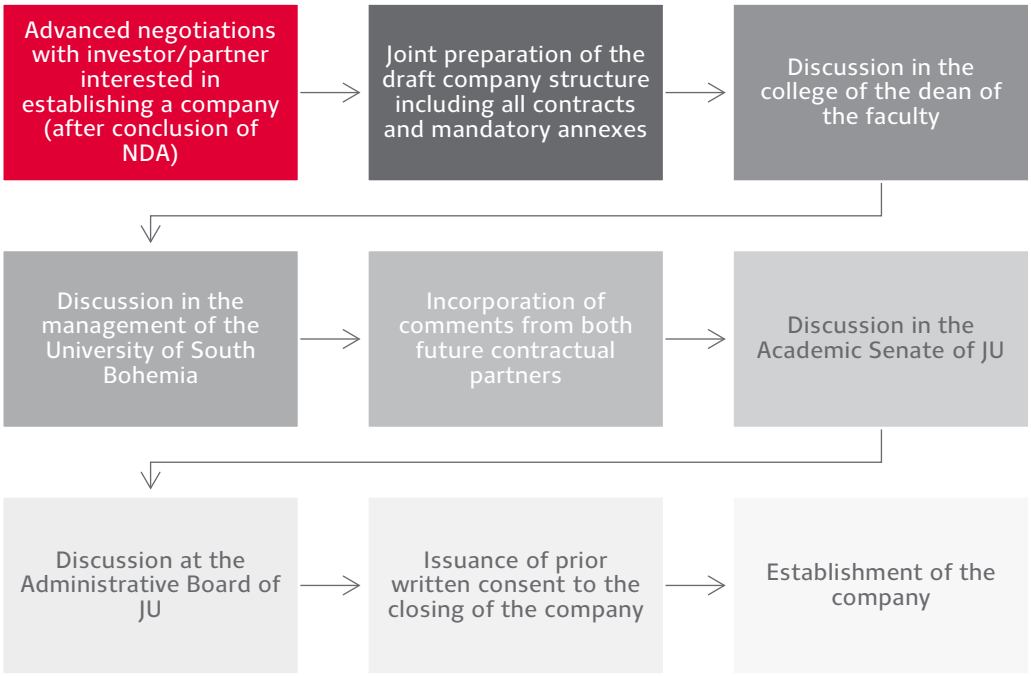


Figure 26 General procedural flowchart of company formation at JU

The head of the Technology Transfer Office has the right and duty to control the management of the legal entity, he/she is obliged to monitor the fulfilment of the legal entity's legal obligations, in particular compliance with the reporting obligation to the state administration authorities, and monitors the results of the legal entity's management and the fulfilment of the objectives for which it was established.

Other forms of cooperation between the USB and the spin-off company will be established in accordance with the approved proposal for granting the status of the USB spin-off company or according to specific needs for further development of cooperation.

A contract may be concluded with the spin-off company to enable it to use the research infrastructure of the JU (e.g. laboratory facilities and their equipment), or other contracts may be concluded to deepen the ties between the JU and the spin-off company and to facilitate the commercialization of the USB's intellectual property or to ensure the necessary degree of control by the USB. The preparation of such contracts is the responsibility of the Technology Transfer Office.

At the same time, it is necessary to define other parameters right at the beginning of the cooperation, namely the conflict of interests of the employees concerned, who will continue to work for the University of South Bohemia and will also become employees of the newly established company, and to regulate their information obligations towards both employers. Furthermore, it is necessary to contractually define the relationship between the partners and the future treatment of the newly created intellectual property, the procedure for joint promotion and media coverage and mutual ongoing information.

Figure 27 General process flowchart of the follow-up steps after the establishment of a spin-off company

In terms of procedural management and document recording related to this issue, the Technology Transfer Office records and archives all documents related to the establishment of spin-off companies and the USB's participation in their activities.

These documents include, but are not limited to:

- a proposal to establish a legal entity or to acquire a participation in a legal entity, including the particulars,
- required under this measure, i.e. the opinion of the Proponent and the opinion of the Technology Transfer Office,
- a proposal for granting the status of a spin-off company to USB,
- approval of the proposals by the Rector of USB or its request for refinement or change,
- the statement of the Academic Senate of USB,
- prior written approval of the USB Board of Trustees,
- the constituent documents of the legal entity and their amendments,
- contracts for the transfer of shares, business holdings or other forms of participation,
- documents documenting changes in statutory bodies and changes in participation of persons on the USB side in other bodies,
- documents documenting the transformation of spin-off companies,
- documents documenting the dissolution, termination of the spin-off company, its liquidation, settlement of the share of the liquidation balance,
- the annual report, the annual, extraordinary and consolidated financial statements, the proposed distribution of profits and their final form or the settlement of losses, unless they are part of the annual accounts,
- auditor's report on the verification of the financial statements and other documents pursuant to Section 66 et seq. of Act No. 304/2013 Coll., on public registers of legal and natural persons and on the registration of trust funds, as amended,
- other contracts between USB and spin-off companies.

On the basis of continuous information and evaluation of the commercialization of USB intellectual property, the Technology Transfer Office prepares an analysis of the results and benefits of the commercialization of intellectual property or other forms of transfer of USB knowledge through individual spin-off companies on an annual basis. The analysis shall also include a detailed assessment of the economic situation of the legal entity concerned or the economic situation of the cooperation in the case of a spin-off or start-up company without the participation of the USB.

The Office of Technology Transfer will submit this analysis to the Vice-Rector for Science and Research and the Bursar of the University as a basis for the preparation of a summary report on the management of legal entities in which the University has an interest. The analysis for the past calendar year, together with the opinion of the Vice-Rector for Science and Research, shall be submitted to the Rector's College for discussion.

If the Office of Technology Transfer discovers facts of a serious nature concerning the management or other significant circumstances in the activities of these legal entities, it is obliged to immediately inform the Vice-Rector for Science and Research.

5.3.2 Tips and tricks for spin-off considerations

Weigh your options, choose a domain that doesn't have sky-high initial development costs, such as online websites and smartphone apps. Leave the world of new computer chips and new drugs to big companies and people with deep pockets. For the rest of us, the following suggestions will help us survive the valley of death:

Before you start, gather some resources. Planning your business always reduces risk. This includes estimating the money needed to get to the income stage and saving up money to cover expenses before you jump off the cliff. Self-funding or bootstrapping is still the most common and safest approach for startups.

Keep your day job until the income starts flowing. A common alternative is to work nights and weekends at a startup and survive the valley of death through another job or the support of a working spouse. Of course, we all recognize that this approach will take longer and could jeopardize both roles if not managed effectively. Set expectations accordingly.

Ask friends and family for funding. After bootstrapping, friends and family are the most common source of funding for start-ups. As a rule, this is a necessary step anyway, because outside investors usually won't consider providing any funding until they see the "skin in the game" from the inside.

Take advantage of crowdfunding. The hottest new way to fund startups is to use websites like Kickstarter, where you can ask for donations, pre-orders, get rewards or even provide equity (coming soon). If your offer is interesting enough, you can raise millions in small amounts from other people online to help you soar high above the valley of death.

Apply for competitions and business grants. This resource is getting a lot of attention these days thanks to government initiatives to encourage research and development in alternative energy and other technologies. The upside is that they don't give up any equity, and they apply to the early stages of a startup, but they take time and a lot of effort to obtain.

Get a loan or credit. This alternative is only realistic if you have personal property or a house that you are willing to provide as collateral to secure the loan or line of credit. Banks will generally not give you a loan until the business is cash-flow positive, regardless of future potential. However, it is an option that does not cost you equity.

Join the incubator for budding entrepreneurs. A startup incubator is a company, university or other organization that provides equity funding to nurture young companies and help them survive and grow during the start-up period when they are most vulnerable. These resources often include a monetary investment as well as office space and mentoring.

Exchange your services for theirs. Barter technically means the exchange of goods or services in exchange for money. An example would be getting free office space by agreeing to be the property manager for the owner. Bartering your services for services is possible with legal consultants, accountants, engineers, and even salespeople.

Joint venture with a distributor or recipient. A related or strategically interested company may consider the value of your product to be complementary to theirs and may be willing to provide a very early funding advance that can be repaid later when you develop your revenue stream. Consider licensing your product or intellectual property and "white labeling."

Make a commitment to an important customer. Find a customer who would benefit greatly from getting your product first and is willing to advance you development costs based on their past experience with you. The advantage to the customer is that they will have sufficient control over whether the product meets their requirements and will receive dedicated support.

The good news is that the cost of new startups is at an all-time low. In the early days (20 years ago), most new ecommerce stores cost a million dollars to set up. Now the cost is closer to $100 if you're willing.

6 Cooperation in research

Does research collaboration fall within the remit of knowledge transfer? This is a question that is plaguing many research organizations (especially in Central and Eastern Europe) and their TTOs. It is the subject of much discussion and philosophical debate. Its bearers are always very well able to argue one way or the other. The ambition of this chapter is not to give a clear answer. It is included here for a pragmatic reason. If we accept that research and creative activity is a flowing continuum that engages with themes rather than specific tasks over a long period of time, then we must also accept that the results of research and creative activity emerge and are refined to varying degrees of maturity and readiness. Especially in the case of interdisciplinary applications, the author is not one person or one team, but the involvement of different experts is needed. Thanks to project funding, research consortia are often formed, often involving not only universities but also non-profit bodies or companies of a very wide range of different types.

The regulation of the relations between these cooperating entities has a major impact on the usability of the results of this cooperation and if it is not also treated from the point of view of future or potential knowledge and technology transfer, it can easily happen (and historically, unfortunately, it often happens) that the results are subsequently treated strangely and incorrectly.

Some sources indicate that it is important for the success of technology transfer that academic institutions offer collaborations with the application sector, such as contract research, collaboration with enterprises, contract services and infrastructure rental, and that the procedures and rules regarding these forms of collaboration are clearly defined. This interaction is key to building a long-term relationship of trust, knowledge of both types of environments and respect for its needs. Without these cornerstones, final success in the form of licensing or successful spin-offs cannot be expected.

Yet, in many universities and research organizations, the transfer agenda and research collaborations are separated because of seemingly different agendas. Knowledge and technology transfer is according to simplified process schemes (see Figure 2 on page 11) is more or less reduced to the agenda of intellectual property protection (often further reduced to industrial rights) and subsequent licensing. Collaboration with companies is more about project planning and budgets, where, in addition, project outputs do not go through the aforementioned process. The commercialization process is significantly different, as it is assumed that the collaborating company is interested in commercializing the result from the beginning of the collaboration.

However, practice shows that this assumption is wrong in many cases. Moreover, even in the few cases where it is correct, it is important to correctly negotiate at least the basic conditions of commercialization before the project starts. Unfortunately, it happens all too often that if the terms are not set correctly and fairly, the corporate partner manages most of the activities of the transfer process in its own interest. Perhaps in every Czech research organization there is an example where the result of the collaboration has been very well applied on the market, but all the benefits associated with it go only to the collaborating company. The institution of co-ownership of results is an unfortunate standard in such cases.

However, a huge and common intersection of the two topics is contractual relationships securing the rights of partners, valuation, negotiation, knowledge base identification, and risk management. Thus, it can definitely be recommended that these agendas work closely together.

6.1 Types of interactions with the application sphere

The overview of possible activities of a research organization in terms of knowledge and technology transfer can be divided according to three basic criteria:

1) Use of existing assets, including intellectual property rights:
    a. Interaction uses the tangible assets of the research organization.
    b. Interaction uses the intangible assets of the research organization.
    c. The interaction consumes the actual resources of the research organization - people's time, energy, consumables, etc.

2) Origination and subsequent rights to results:
    a. No new outcome is expected to be created in the interaction (so what is created?).
    b. Within the interaction, only the creation of a new material result is assumed.
    c. A new intangible result is expected to be created in the interaction.
3) Types of partners involved:
    a. State or public administration.
    b. Non-profit sector.
    c. Other research organizations.
    d. Private entities.
4) Sources of funding:
    a. Institutional money.
    b. Earmarked and project subsidies.
    c. Private sources.

All these criteria have an impact on the setting of the terms of the interaction, its cost and the complexity of the negotiation. The individual parameters can be freely combined with each other. Even if there is an almost complete intellectual property subject matter that is sufficiently well specified and legally protected, a co-development arrangement may be part of the license agreement. Abroad, this is often taken as part of the royalty, even though it is a payment for collaborative research.

Collaborations often arise in the context of grant calls, when they serve to create interdisciplinary teams and to implement applied research (see also chapter 1.1). In such cases, the consortium of grant applicants seeks to fulfil the conditions of so-called collaborative research, i.e. the characteristics of an effective collaboration.

In many cases, relatively small contracts are created when the partners are just getting to know each other and testing each other. Research organizations sometimes offer their spare capacity for small analyses, calculations or models.

In fields close to true basic research in the original sense, discoveries can also be made that fundamentally change the way science and research are conceived in other fields. The discovery and design of the electron microscope is one such example.

- *Electron microscopy in the Czech Republic: the story of a technology that was not appreciated at the time.*
- *At the time of its inception and development, electron microscopy was not patented, nor would it have made sense. The patent would expire before a commercial application could be found.*
- *The scientific community could not imagine why it would need such a complex and incredibly expensive technique. It was seen as a toy for physicists. Today, we can't imagine a better laboratory without an electron microscope. At that time, companies were not interested in producing something that had no clear market.*
- *It took more than 30 years of immeasurable effort by the research organization before electron microscopy became commercially interesting. This meant convincing the scientific and industrial community by demonstrating the new technique at conferences, tours and free tests. Alongside this, further optimization, automation and expansion of capabilities was underway. (Scholzová, Beluský, & Smekal, AVEX: Expert Opinion of the CAS: Knowledge and Technology Transfer, 2022)*
- *Today, four of the world's largest manufacturers of electron microscopes have a direct historical link to the original Brno group of the Institute of Instrumentation and Dr. Armin Delong. Three of them even still operate in Brno today.*

A similar situation is the various access to research infrastructures, whether they are the unique result of their own research or just a well-equipped laboratory with clean facilities or meeting high security standards. The rules for accessing infrastructures follow similar rules to other interactions.

The fourth group of interactions is the provision of expert knowledge, again at very significantly different levels. The provision of consultation is a popular form of research-practice interaction, but it is also very often messy, haphazard and unrecorded. Remarkably often, consultations are provided free of charge. Overseas, west of our borders, research organizations tend to have affiliated offices (similar to TTOs) that take care of the consultation, including providing the necessary insurance to protect researchers, proper remuneration, protection of the research organization's intellectual property and reputation, through to administration and record keeping. Research organizations in the Czech Republic have yet to mature to this concept.

Interactions with the application sphere can be imagined as a never-ending spiral of mutual inspiration and relationship development.

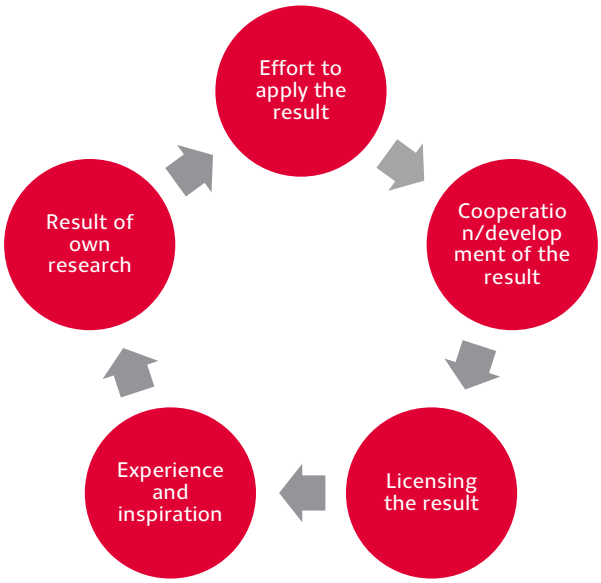


Figure 28 Cycle of interaction and inspiration with the application domain

6.2 Research partner - preparing for the meeting

For a proper and fair contractual setting in research, it is also necessary to be concerned about who is a partner (Scholzova & Belusky, "Transferring quickly and easily" series, part 6. Research collaboration):

- What type of partner are you talking about? Who are its beneficiaries?
- What is his legal background?
- What's his field? What kind of competition is there? How does it stand in the market?
- Where does it operate and work? Where does it produce, where does it trade? What ambitions does it have in relation to our particular collaboration?
- How did we meet him? Have we had any previous experience?
- From what sources will the costs be covered?
- What does he expect from working with us? What are his needs?
    - Does he want to improve his own production? Gain a competitive advantage? Solve a current problem in the existing portfolio? How fast does it need to be and how reliable does the result need to be?
    - Does he want to save money on his own development, or will it be a collaboration with their development center?

- Does he want to take advantage of our good name or increase his value, for example through the licenses he holds? Do we want him to build on our reputation?
- Does it want to expand its portfolio with new products or enter new markets? Is it brand new and doesn't want it to be known?
- Does he want to get public money from projects?

All of these questions and especially the answers to them give a good insight into the upcoming project and especially provide the basis for a future contract. The answers to the above questions also set the boundaries for negotiating the price for the cooperation. Every project, every collaboration is unique in its own way - in some cases we can start from list prices, in others the non-monetary dimension will be so interesting for us that we can consider a significant reduction and vice versa, there are also cases where a substantial increase in price and a reduction in access is completely appropriate.

6.3 Research cooperation agreement

Czech law does not have a specific research cooperation agreement. Therefore, in cooperation with lawyers, it is necessary to choose either a suitable alternative type of contract or to create a special contract, so-called unnamed contract. (Act No. 89/2012 Coll., Civil Code) defines the basic contract types, specifies the form of the contract and the methods of their conclusion, and also defines the functionality of the general terms and conditions. However, in the case of research collaborations, it should be borne in mind that we are working with intellectual property and their specificities should be taken into account. We must also not forget (Act No. 130/2002 Coll. on the Promotion of Research and Development from Public Funds, 2002) and its §16, which has been amended many times over the last few years.

So what needs to be clarified and subsequently modified in the contract?

- What will be the object and goal of the interaction?
- What are the contributions of each party - monetary and non-monetary, mutual benefits, knowledge background?
- What are the access rights and conditions for accessing deposits?
- What are the expected types of interaction results – foreground?
- How to work with these results (future licenses):
  - Who will they belong to?
  - Who will have access rights to them?
  - Who will and can do what with them - publication, protection, access, use, enhancement, abandonment, commercialization, ...?
  - What will be the revenue and cost shares?
  - What will be the mutual control options?
- Other important matters

What choices do we have from the standard types?

6.3.1 Purchase contract / contract for the construction of the work

The contract of sale is specified in § 2085 et seq. (Act No. 89/2012 Coll., the Civil Code):

- A contract for the supply of consumer goods to be assembled or created is always considered a contract of sale.
- A contract for the delivery of a thing yet to be manufactured shall be treated as a contract of sale unless the party to whom the thing is to be delivered has undertaken to deliver to the other party a substantial part of what is required for the manufacture of the thing.

- Possibility to buy on trial.

Under Czech law, a contract for work is a contract that creates a contractual relationship, the subject of which is the construction, maintenance, repair or modification of a certain thing or activity with a different result. In the case of a works contract, the parties to the contract are the contractor and the client.

The contractor undertakes to carry out the work within the agreed period at his own expense and risk for the client. The client undertakes to accept the work and pay the agreed price for it. This contractual obligation is currently governed by the provisions of § 2586 - § 2635 of the Civil Code.

§ 2586 et seq. (Act No. 89/2012 Coll., the Civil Code)

- The contractor undertakes to carry out the work at his own expense and risk for the client and the client undertakes to accept the work and pay the price. The work is understood to be the construction of a certain thing, unless it falls under a contract of sale.
- The contractor may also provide the result of the work, which is subject to industrial or other intellectual property rights, to persons other than the client, if so agreed.

The price for the execution of the work may be determined either by a fixed sum, by reference to a budget which is necessary for the execution of the work, or it may also be determined by an estimate or by a non-fixed sum. The parties should be aware that if there is a fixed amount, then neither the client nor the contractor can claim a price adjustment on account of any higher costs of the work than originally anticipated by the parties.

Comparison of the suitability of both types:

It is not the result of creative activity (routine research service):

Purchase contract = the item is selected from a catalogue/price list, the material for production is provided by the contractor (a research organization).

Works contract = activity takes precedence over material, supplier supplies its own material.

⇒ the owner is usually the one who paid for it

It is an author's or other work of a creative nature.

Works contract = work made to order - §61 (Act No. 121/2000 Coll., Act on Copyright, on Rights Related to Copyright and on Amendments to Certain Acts)

⇒ the owner is the one who made the work, the one who paid gets the license to use according to the contract.

Therefore, if the subject of the interaction will be the creation of new intellectual property, these types are completely inappropriate!

6.3.2 Results in cooperation

Parties may make various non-financial contributions to a joint research project:

- **Infrastructure and specific equipment:** research organizations often have access to unique high-end equipment that companies are logically not willing to buy unless they carry out the development themselves. There has long been a great deal of interest among companies in an overview of available and accessible laboratory equipment, and several efforts have been made to map what is available in the Czech environment. It must be frankly admitted that these efforts have not been very successful so far. Research organizations should, in their own interest, create their own internal map of instruments and equipment that they are willing and able to offer for further use. Some instruments have to run 24/7 and are little used for two-thirds of their time, others could run without much trouble in a similar mode. It is the responsibility and duty of research organizations to consider whether they are using their equipment efficiently and effectively with due care. A map of equipment, including a price list and associated consumables, is then an important aid in arranging collaborations.

- **Human knowledge and skills:** one thing is operating sophisticated instruments, another is interpreting the data, and a third is actual creative activity. These are the three basic levels of knowledge and skills of people who have been involved in a subject at a high level for a long time and who are not usually available in industry. The value of these people is not determined by their paycheck, but by comparison to the market, or by consideration of replacement value - how long and how much would it take to train a person to be able to do the work needed at the quality needed? When considering the cost of highly skilled labor, look and be inspired by what programmers or lawyers in the region charge. And how much does a skilled craftsman charge? Underestimating a person's time is the most common mistake in collaborative pricing. Don't forget about support staff and overhead as well.
- **Intellectual property:** in this respect, it is very useful to have a well-developed internal register of intellectual property including not only patents, utility models, software, databases, but also know-how or trade secrets, trademarks, methodologies, recipes and other useful elements. The definition of the knowledge base in the contract is extremely useful for future proof of what type of collaboration was involved.

A completely analogous consideration needs to be made about what will emerge in the context of cooperation:

- **New or upgraded equipment** - the device created is in a completely different category than the device purchased. Can it be patented or otherwise protected? Can this improvement be used in other ways and elsewhere? By whom? Was it a primary outcome of the project or a secondary need? Does it have the quality of a demonstrator, a working sample, or already a prototype with production documentation?
- **New technologies, methods, procedures** - analogous to material things. In what form will it be processed, what is the expected maturity and state of verification?
- **Intellectual property** - inventions and technical solutions suitable for protection. Who will provide protection and where? Trade secrets, know-how, software, databases? On which side what was created and who will have what rights to what? Estimation of future expected results is extremely important to defend the type of cooperation.

The treatment of the rights to "background IP" should be addressed in the contract both during the project (for example, by gratuitous mutual disclosure for the purpose of joint research and the achievement of a common goal, but with limited dissemination or prohibition of use for other purposes) and after the end of the project (mutual obligation to disclose for the benefit of the use of the results for an agreed consideration or free of charge).

Specify the rules for the use of "foreground IP" at least in basic terms. It is understandable that it is difficult to agree on the details of something that does not yet exist. However, there should be agreement in principle and, in view of reality and experience, do not be afraid to put in the contract even quite obvious and trivial positions (for example, that the rights primarily belong to the party who created the result). Adjust the rules for ownership and future use of the results, including mutual financial compensation. Agree on rules to ensure protection, maintenance and funding. Clarify the rules for publication and use for teaching and further research.

§ 16 (Act No. 130/2002 Coll. on the Support of Research and Development from Public Funds, 2002)

For the use of the results, with the exception of paragraphs 1 and 2, the following shall apply

- *if the beneficiary is a research organization or research infrastructure operator and has exclusive rights to a result fully financed by public funds, the exploitation of the results is possible in particular through teaching, public dissemination of research results on a non-exclusive and non-discriminatory basis or knowledge transfer46),*
- *if the recipient of the earmarked project support is an undertaking together with a research organization or research infrastructure operator, then:*
- the results of this cooperation, which cannot be protected under the laws governing the protection of the results of copyright, invention or similar creative activity, may be freely

distributed and the rights to the results resulting from the activities of the research organization or research infrastructure shall vest fully in the beneficiaries; or

- *any rights to the results of the project, as well as related access rights, shall accrue to all collaborating entities to the extent appropriate to the extent of their participation in the project; or*
- *the research organization or research infrastructure operator shall be compensated by the collaborating undertaking at market prices for the rights to the results of the project arising from their activities and assigned to the collaborating undertaking or to which the latter has acquired access rights.*

Read the above text of the law again, carefully and in parts (in the version currently in force):

- The law does not require research organizations to give their results to everyone publicly and for free. On the contrary, it provides for the possibility of knowledge transfer. This option directly imposes an obligation to consider the possibilities for transfer and, where it makes sense, to put in place procedures that limit publication.
- Point 1. What are the results that CANNOT be protected? If protection of creative activity can also be considered protection in the form of trade secrets, then it is difficult to stop such a result. What the legislator meant by this the authors of this study material have no idea. Presumably he meant that what is not protected should be published.
- Point 2. This point is a bit of a problem because it allows for interpretive ambiguity causing difficulties with co-ownership. Under other laws, the rights should belong to those who contributed creatively to its creation. But here we are not talking about a share in the creation of a particular result, but a share in the solution of the whole project. Contribution does not just mean the costs paid! Edit this section in the contract so that there can be no interpretative confusion.
- Point 3. actually substitutes or directs the omission of royalties. So don't forget it.

  ATTENTION on co-ownership.

  Some providers (TAČR) encourage partners to enter into co-ownership agreements as part of their efforts to meet the conditions for effective cooperation. It should be handled very carefully and be aware of the significant risk of asymmetry between the research organization and the company!

  Each of the co-owners has the right to use the result for their own needs without the consent of the other co-owners. The company can therefore use it for its business and profits and the research organization for teaching and research. Is that fair?

  On the other hand, the granting of a license to a third party or the transfer of rights requires the consent of the other co-owners. Thus, a research organization cannot even license a result to another company unless the co-owner gives its permission.

  Always negotiate the royalty analogy and terms of use on both sides in the contract!

6.3.3 Price per interaction

The previous sections of this chapter have already outlined the components that should not be overlooked when pricing collaboration. In principle, several approaches can be used to determine the price, bearing in mind that operating costs, depreciation, taxes, margins, people's remuneration, overheads and the value of intangible assets are combined. This must necessarily be reflected in the combination of appropriate valuation methods. The calculation should be done in collaboration with the accountants and economists of the research organization, as they have a thorough knowledge of the relevant regulations:

- **Cost method** - price determined on the basis of costing. This method seems to be the simplest, but it can only be applied if you know the direct and indirect costs of each item. It cannot be applied to intellectual property and is not recommended in relation to people. A modification of the cost method is the so-called replacement cost approach, which is based on the principle of recovering the corresponding value from publicly available resources.

- **Market (comparative) method** - sometimes also known as the normal price based on a comparison of prices of competing solutions or alternative procedures. Foreign industry data may not always be relevant and is usually difficult to obtain in research. Many research results are unique, but to consider commercialization it is very useful to look at how costly alternative solutions are.
- **Income method** - directly intended for valuation of intellectual property. It is based on the expected economic success of the future acquirer, which is discounted to present value. A lot of additional information is needed for a proper consideration and it is always a more or less rough, rather order of magnitude estimate.

When calculating the price, it is a good idea to compare different considerations and set limits for negotiation. It is very important to realize that lowering the price puts the research organization (and with it the undertaking) at risk of unlawful public aid.

European Commission (Communication from the Commission - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) recommends that the price for contract research and research services be set at market prices, less the cost of the intellectual property rights that will remain with the research organization. If the situation arises that the market price cannot be determined, then it is the responsibility of the research organization to take into account the **full costs** (direct and indirect) and the **usual margin** (the usual margins in industry can be found in published tables and are usually not the 5% we hear from some institutions).

If the price set in this way would be too high for the partner and the collaboration is still important for the research organization and has other significant benefits, then the partner can reduce the price by covering its marginal (direct) costs and seek to achieve maximum economic benefit in the negotiations and negotiate the contract at arm's length. This situation may arise in particular where the cooperation is a first-time, trial cooperation and is valid only for a clearly defined period.

For effective cooperation projects, the conditions are set slightly differently in paragraphs 29 and 30 (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022). The reciprocal rules are set correctly if at least one of the following conditions is met:

The participating undertakings bear the full cost of the project, or

Yes, this is indeed possible and is confirmed by other provisions of the Framework that all costs can be borne by the company and do not have to be contract research. If you ever go to the Ministry of Education to negotiate, print this paragraph out and take it with you.

- *The results of collaborative activities which do not result in the creation of intellectual property rights may be publicly disseminated and the intellectual property rights arising from the activities of the research organizations are fully vested in them; or*
- *the intellectual property rights arising from the project, as well as the related access rights, are distributed among the different collaborating partners in such a way as to take due account of their respective areas of work, contributions and respective interests; or*
- *research organizations or research infrastructures shall be compensated at market value for intellectual property rights arising from their activities and assigned to participating undertakings or to which participating undertakings have acquired access rights. From this compensation may be deducted the absolute value of any financial or non-financial contributions made by the participating undertakings to the costs of the activities of the research organizations or research infrastructures which gave rise to the intellectual property rights in question*

Here's a straightforward guide on how to customize rights to results in a contract, and it should be standard in all interactions.

To clarify what is meant by the market price for IPRs, it states (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) in the very next paragraph 30:

For the purposes of point 29(d), the Commission will consider that the compensation received corresponds to the market price if it allows the research organizations or research infrastructures concerned to enjoy all the economic benefits associated with those rights, provided that one of the following conditions is met:

- *the amount of compensation was determined on the basis of a sale in an open, transparent and non-discriminatory competitive procedure; or*
- *an independent professional appraisal confirms that the amount of compensation is equal to or greater than the market value; or*
- *the research organization or research infrastructure can demonstrate that, as the seller, it has effectively negotiated the compensation on arm's length terms so as to obtain the maximum economic benefit at the time of the conclusion of the contract, taking into account its statutory objectives; or*
- *the collaborating undertaking shall have a right of first refusal under the collaboration agreement in respect of intellectual property rights arising from the activities of the collaborating research organizations or research infrastructures, and these entities shall have a reciprocal right to request economically more advantageous offers from third parties so that the collaborating undertaking is forced to adjust its offer accordingly.*

If you read carefully and repeatedly, you will find that it is not true that you have to do expert opinions on intellectual property rights, nor do you have to do open, transparent and non-discriminatory competitions. It only applies if you do not meet the other conditions of paragraph 29 and even then you are free to make proper profit calculations and then negotiate the price taking into account objectives other than profit.

6.4 The phenomenon of contract research

National definitions (Act No. 130/2002 Coll. on the Support of Research and Development from Public Funds, 2002) states that contract research means research carried out on behalf of an undertaking in accordance with a directly applicable European Union regulation, using a research organization or research infrastructure, whereby the undertaking owns the results of the research activities, bears the risk of failure and provides the research organization or research infrastructure with a reasonable remuneration for the services received.

In addition, the direct source (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) defines the term 'contract research' in section 2.2.1 as one form of research on behalf of undertakings. Unfortunately, it does not provide a definition of the term, but in this chapter it gives its defining features. The term 'contract research' is always mentioned in the company of the term 'research service' and considers this activity to be an economic activity for which public funds and supported infrastructure should be used in a strictly limited quantity and form. 'Contract research' is not considered a form of collaborative research.

2. 2. 1 Research on behalf of enterprises (contract research or research services)

(26) Where a research organization or research infrastructure is used to carry out contract research or to provide a research service for an undertaking which normally sets the terms of the contract, owns the results of the research activities and bears the risk of failure, no State aid will normally be passed on to that undertaking if the research organization or research infrastructure receives a reasonable remuneration for its services. This is in particular the case where one of the following conditions is met:

- *the research organization or research infrastructure provides the research service or performs contract research at a market price (Where a research organization or research infrastructure provides a particular research service or performs contract research on behalf of an undertaking for the first time, on a trial basis and for a clearly defined period of time, the Commission will normally consider the price charged to be the market price if the research service or contract research is unique and it can be demonstrated that there is no market for it); or*

- *where a market price cannot be determined, the research organization or research infrastructure provides the research service or carries out contract research at a price that:*
    - *it reflects the full cost of the service and generally includes a margin based on the margins normally applied by undertakings operating in the sector of the service concerned, or*
    - *it is the result of arm's length negotiations, provided that the research organization or research infrastructure, as service provider in the negotiations, seeks to obtain the maximum economic benefit from the conclusion of the contract and covers at least its marginal costs.*

(27) Where the research organization or research infrastructure retains the intellectual property right or the relevant access rights, their market value may be deducted from the price to be paid for the services concerned.

It further states that

The costs of contract research, knowledge and patents purchased or acquired under license from external sources at market conditions, as well as the costs of consultancy and equivalent services used exclusively for the purposes of the project are eligible project costs.

A third source for the interpretation of the term "contract research" is the 2015 Contract Research Data Submission published on the website www.vyzkum.cz on 27 August 2015. This states that: contract research can be characterized as research activities carried out by a research organization that are associated with the provision of high value-added services, i.e. generally services commissioned and reimbursed by the other party, where the costs and reasonable profit of the research organization are also reimbursed by the other party. These are mainly research and development services, including related consultancy services (e.g. sample processing, custom measurements, testing, etc.). The outcome of a contract research project is usually one of the following types of results (according to RIV15) - patent, semi-process, proven technology, variety, breed, utility model, industrial design, prototype, working sample, results reflected in legislation and standards, results reflected in directives and regulations of a non-legislative nature binding within the competence of the relevant provider, results reflected in approved strategic and conceptual R&D&I documents of state or public administration bodies, certified method, treatment procedure, monumental procedure, specialized map with specialized content, software, research report, summary research report, etc.

It is clear from the above quotations that the national definition is based on the features set out in the Framework, but without taking into account the other provisions of the Framework, in particular the context of the transfer of indirect public support to an undertaking in the case of the use of a publicly funded research organization or infrastructure. This definition states that 'contract research' is an activity carried out by a research organization where the undertaking owns the results of the research activities, bears the risk of failure and provides a reasonable remuneration. In an absurd result, this definition may lead to the conclusion that if an undertaking does not provide a reasonable remuneration (and therefore effectively favors the undertaking and therefore undesirable indirect public aid), it is not 'contract research'.

In addition to the definitional problem, there is also the traditional perception of the term contract research, where, purely from the origin of the word, it refers to any research carried out on the basis of a contract. This view is further supported by accounting and tax legislation, which specifies economic activities as such that generate tax-free income for research organizations.

A third effect that has a significant impact on the identification of activities as 'contract research', inconsistent with the Framework concept, is that 'volume of contract research funding' has been, and in many cases still is, used as a measure of success for some projects and is part of the evaluation of science.

These three facts lead to a significantly wider range of activities that are not considered as 'contract research' by the framework, including research collaborations, effective cooperation or knowledge transfer.

On the side of the beneficiaries, the type of activities is not yet properly distinguished in accordance with the Framework, but they are recorded as economic activities due to the dominant influence of accounting and tax regulations.

From the point of view of providers and control bodies, any collaboration with an undertaking where the costs of the research organization are even partially reimbursed by the undertaking is considered contract research. This is further supported by the approach to the problematic definition of eligible R&D results and their target ownership, where the right of the research organization to dispose of the R&D results, including knowledge transfer, is not taken into account. The target state is considered as decisive.

In a situation where research is paid for by non-public sources, the "independence" of such research is further questioned. The independence of research is a key concept, but it is not well defined and is the subject of much debate. It is research that is carried out independently by staff of a research organization for their own motives. As long as it is also funded by its own resources, there is no dispute that it is likely to be independent. Can independent research be paid for by earmarked grants awarded under thematic competitions? Again, it is probably generally agreed that as long as the topic of the competition was sufficiently open, then here too the independence of the research can be recognized. In the case of privately funded projects, doubts often arise.

Framework (Commission Communication - Framework for State aid for research, development and innovation (2022/C 414/01), 2022) states that independent research is considered to be research aimed at gaining new knowledge and a better understanding of the topic, including collaborative R&D, where the collaboration in which the research organization or research infrastructure is involved is effective. (See also the definitions of terms in the chapter 1.2).

In the years 2017-2020, a working group of the RVVI, initiated by the Confederation of Industry of the Czech Republic and the Technology Transfer Centre of the CAS, attempted to remedy the situation. In November 2020, the Government of the Czech Republic approved the resulting methodological recommendation "Identification of economic and non-economic activities of research organizations and research infrastructures in research, development and innovation". (RVVI, 2020). The methodology is the result of a consensus among universities, public and private research organizations, representatives of grant providers and the final form was also approved by the Office for the Protection of Competition. It is therefore surprising that the methodology has fallen into disuse. The Ministry of Education, Youth and Sports of the Czech Republic continues to publish its methodology (MOEYS, 2022) which emphasizes completely different reporting issues than those identified by the working group.

At the same time, the TTO Circle group initiated a similar discussion at the JRC level of the European Commission based on an impulse from the Czech Academy of Sciences and a similar methodology was developed. It turned out that the issue of public aid is perceived quite differently in Western countries and in the countries behind the former Iron Curtain. The result is the published methodology "State Aid Rules in Research, Development & Innovating". (Kebapci, Von Wendland, & Kaymaktchyyski, 2020). However, there is little reflection in Czech practice.

Framework (EU)	Environment of the Czech Republic
A limited group of research where the research organization is at a disadvantage or is merely a service to the company	Any research carried out under the contract
Independence of research - not specified	Independence of research is only possible if non-public funds are excluded

Economic activity carried out as purely incidental (up to max 20% of capacity)	Monitoring indicator for projects, the volume of which is desirable to maximize. Often even the main objective of the project, Misclassified activities.

Table 1 Comparison of basic parameters of EU and Czech contract research

This interpretive ambiguity, reinforced by various other standards, rules and laws, results in highly restrictive attitudes of providers and control bodies, and a de facto impossibility to take advantage of the benefits introduced by the Framework for Research Organizations. The current situation leads to the fact that desirable knowledge transfer activities and efforts to put R&D results into practice and to support the development of competitiveness are eliminated with a precautionary approach in many organizations or generally classified as economic activities within the allowed limit of 20%. Under the correct approach, most of the research collaborations carried out would not count towards this limit at all, as they would be classified as primary activities, i.e. non-economic activities (although they would be duly taxed).

7 Socio-economic impact on society

Socio-economic factors are among the significant factors affecting the life of every individual. In sum, these are experiences, social relationships, attachments and experiences that lead to the improvement of individuals and also help to change attitudes towards lifestyle. Globally, they also influence sub-regions (Chase, 2016).

These factors are not just a matter for individuals, they also play a role in business. Especially in terms of employees, their number or gender, whether or not they are family members, etc. (Delmelle, Hagenlocher, Kienberger, & Casas, 2016).

Socioeconomic factors are generally defined as each individual's relationship to financial, social, cultural and human capital resources. These factors mainly include education, occupation, household status, family composition and family income. (National Centre for Education Statistics, 2013). The law of social influence (social impact theory), which is based on the social influence model, identifies the three most important factors namely: power, number and proximity.

Power itself determines for an individual within a society how important a given thing, a given group, is to him. The number itself clearly defines the total volume or quantity. Proximity, as a tactic, defines the activity of connection. Thus, the more active the connection the more influence a person, etc., has on a given individual. Distance alone reduces the influence significantly.

In general, socio-economic factors from the perspective of the individual can be divided into individual and environmental factors:

- Individual factors - in this group we include in particular the achieved standard of living, education, acquired employment, attitude to health, lifestyle habits, nutrition, physical activity, etc.
- Environmental factors - political system, availability and quality of health care, economic situation of the country, infrastructure development.

Everyone's daily life is therefore surrounded by various factors. Each person has his or her own personal value ranking, but most of the factors are largely the same for everyone. Thus, the basic issues for individuals are, as stated above, individual factors, which are strongly influenced in particular by accessibility, level of education, labour market situation and salaries.

From the point of view of foreign practice, it is clear that the field of technology transfer has been developing very dynamically over the last 40 years. The basis of successful transfer is the necessity to have a functional internal process system including the essential decision-making processes. The rules set up should be as flexible and efficient as possible. At the same time, it is an unquestionable fact that the transfer process itself can be flexible, if there are quality R&D innovation results and their general belonging and integrity with the employer is more than obvious, then they are willing to actively participate in the technology transfer process itself. In terms of the needs of the transfer team itself, there is a need for it to provide highly skilled services, and equally there is a need to support the continued skilled growth of its members, precisely so that members can provide quality services. In terms of external factors, relationships with the application sphere, position within the regional, local or national innovation ecosystem and, last but not least, access to capital or other financial resources play the most important role. The sum of all internal and external influences will usually take several years to manifest itself in the area of transfer.

Technology transfer and knowledge transfer are among the unique areas that scientific and research institutions use to connect academia with the application sphere, i.e. to develop the so-called third role of universities. The development of relationship building with the application sphere and the model of functioning of effective technology transfer or knowledge transfer involves and requires unique technology development, special data management systems and highly qualified personnel for successful implementation of the whole commercialization process. The science and research sphere thus offers scope for product innovation and market development, can be attractive for investment and contribute to broad socio-economic development.

Socio-economic impact assessment (SEIA) is motivated by several different, overlapping factors. These can be referred to as the "4A rule".

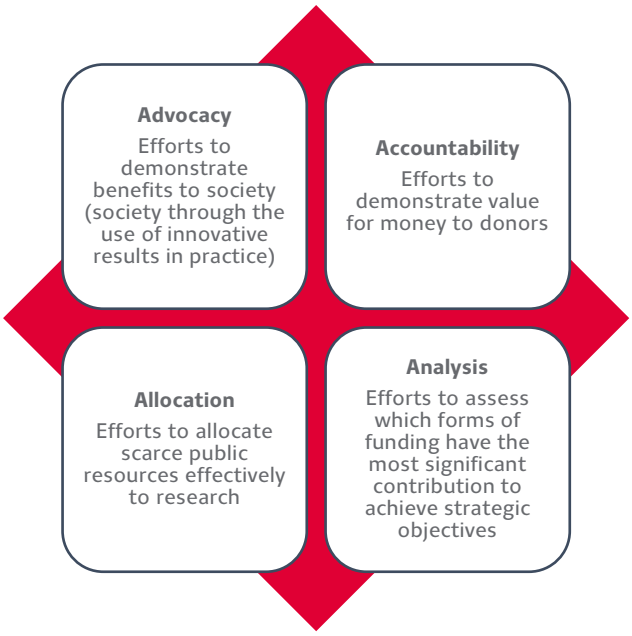


Figure 29 Rule 4A

The basic step for setting up the monitoring of internal procedures for socio-economic impact assessment is to clearly define and define the expected impact pathways to which the research institution is expected to contribute. These impact pathways should be based on an intervention logic, where research infrastructures in particular respond to the needs of the research system, the needs of the economy and, last but not least, the needs of society, and through their activities, outputs and outcomes seek to meet the defined and identified needs.

The impact pathways of any research organization should include the stimuli that are directly influenced by the management of the research organization, e.g. objectives, activities, resources, outputs, etc., as well as the stimuli that are indirectly influenced by the functioning and activities of the research organization (e.g. user outcomes).

In relation to the identification of expected impact pathways and the related intervention logic, four basic evaluation criteria can be identified:

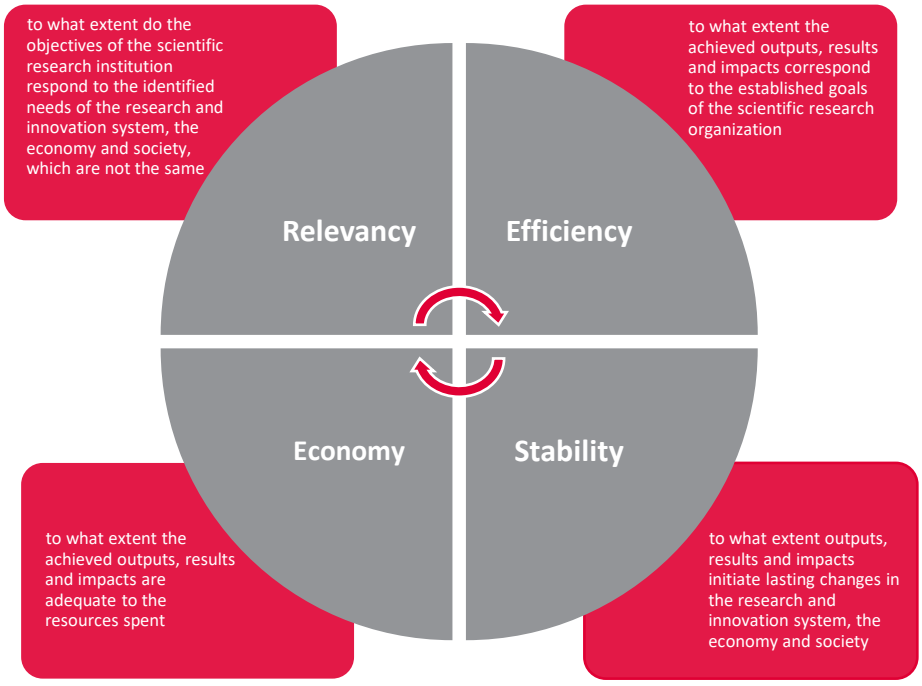


Figure 30 Evaluation criteria

The next step is to define and set up the so-called indicator system for its subsequent calibration and validation. This system should be developed by the scientific research institution and should in particular include continuous monitoring of all activities, resources, outputs, results and impacts related to the area of technology transfer or knowledge transfer. The selected and set indicators should be in line with internationally recognized standards for indicator development - e.g. RACER (Relevant, Acceptable, Credible, Easy and Robust) or SMART (Specific, Measurable, Achievable, Relevant, Time-bound).

The next step is to set up systems to collect data on individual indicators. In order to obtain relevant data, it is always necessary for individual research institutions to be able to clearly identify and attribute the resources, activities and results of the institution from other parts of their operations. Without this step and separation, the socio-economic benefits of the activities and outputs of a scientific research organization cannot be responsibly and correctly assessed.

The final step is the selection of the appropriate methods for the analysis of the indicators and for the evaluation of the individual criteria. Different quantitative and qualitative methods are generally used for the evaluation of individual criteria and a combination of these is always recommended for a comprehensive evaluation. These include, for example, return on investment analysis (RoI), cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), multi-criteria analysis, impact multiplier analysis or case studies.

7.1 Implications for science

The development of science and scientific excellence is one of the fundamental missions of any scientific research institution. Linking and implementing or applying the results of science and research in practice, then developing and strengthening the so-called third pillar of every scientific research institution. The use of results that push the boundaries of human knowledge and are used in corporate innovation and also to address important societal needs is the goal of every scientific research institution that generates such innovative results.

The direction of R&D activities, outputs and results towards impacts on the production and accumulation of new knowledge and methods can be assessed through a set of various subsidy supports such as support for proof-of-concept activities, pre-seed and seed activities, technology incubation, etc.

7.2 Impact on innovation and technology

In addition to the indirect impact of a research institution on innovation and technology development that occurs, research institutions can also contribute directly to innovation. This is through direct cooperation with innovating enterprises or through the provision of infrastructure services for application-oriented research projects carried out in cooperation between research organizations and enterprises. In such specific cases, institutions contribute directly to the creation and transfer of knowledge for the development of new technologies and innovations.

The direction of such activities towards impacts on innovation and technology can be monitored, for example, by indicators of patent activity, licensing, collaboration between the research institution and enterprises, and services for collaborative research projects. These indicators make it possible to monitor mainly activities with a potential impact on innovation and technology, while the impact itself needs to be assessed in the longer term.

There are various software tools for tracking socio-economic impact. These mostly use the theory of change and impact chain methodology.

An effective impact strategy is a prerequisite for measuring social impact. The actual data collection and data monitoring needs to be set up both qualitatively and quantitatively on a scale of so-called impact steps.

Data aggregation is then done through category databases. In the software, it is therefore possible to view the data through the lens of activity categories - for example, to search for all activities for a selected target group, for selected demographic indicators, or for example, all types of activities that have had the greatest success, i.e. have contributed most to a defined social impact.

By collecting impact data, organizations can clearly present the impact of their activities to donors or the public. The software structures and records the data and helps in its analysis and evaluation. This makes it a tool for effective management of projects and programmes, outputs and outcomes, significantly saving capacity in the organization.

The software tool is an aid in terms of monitoring the impact of technology transfer, or knowledge transfer into practice / society based on a system and indicators that are not immediately visible but are nevertheless essential.

Social impact therefore creates opportunities and possibilities not only for human opportunity but for society as a whole, i.e. when society thrives, many other aspects of life thrive, which can lead to bigger and better change. It can therefore contribute to the development of society in different ways and to different extents, and thus contribute significantly to further shifting and promoting a circular economy in which technology transfer or knowledge transfer also has its benefits.

8 Technology transfer in Norway Universities

8.1 Definitions

Commercialization – the whole process from an idea arises, through for example a research result, and until the idea is launched as a business, solution, product or production method in a market and revenue is created" (Meld, 2018-2019)

Technology Transfer Offices (TTO) – are owned, and is governed, by the research institutions they represent and have a service or collaboration agreement with, usually the largest universities, institutes, regional health authorities and health authorities. They have agreements with the owner institutions that regulate their activities, financial responsibility and decision-making authority.

The task portfolios in the various TTOs vary. This is partly related to type research carried out at the owner institutions and whether the offices also have incubation activities. Regional variations are due, among other things, to historical conditions around establishment and business composition in the region in question.

The TTOs are organized as joint stock companies where any profits generated by public grants will be used for activities that are authorized in co-ownership with research organizations (for example, research, education, dissemination, and innovation). TTOs cannot pay dividends.

About half of the revenue of the TTOs comes from the Research Council's FORNY2020 program. Other income comes from licensing (patents), sales of shares and sale of services to publicly funded research institutions, where the university and college sector and the hospitals are key customers. They also have investments from the parent institutions." (Meld, 2018-2019)

Intellectual Property Rights – "An intellectual property right gives an exclusive right to exploit an innovation commercially, at the same time as the innovation is made public. Copyright and registration of a patent, design or trademark thus help to secure the return and reduce the risk of the investment by developing an innovation. " (Ministry of Trade, Industry and Fisheries Norway, 2013)

Types of intellectual property rights:

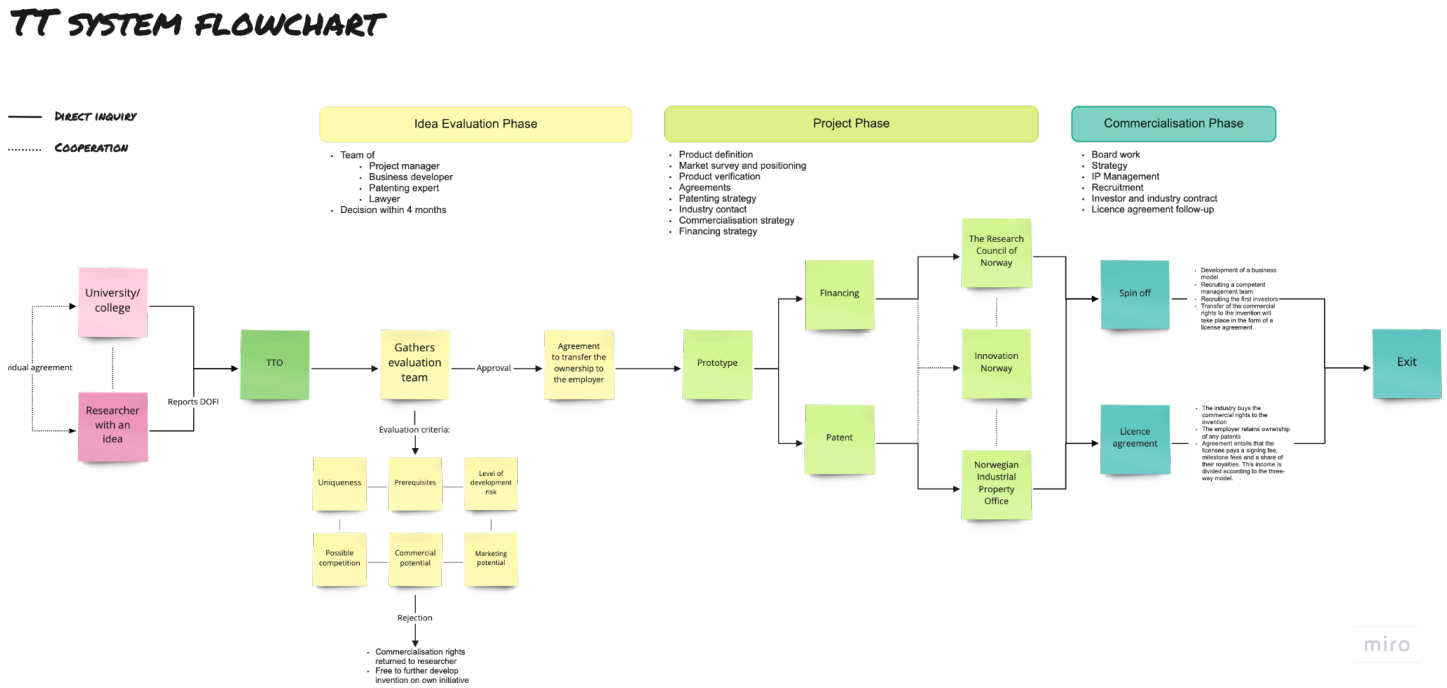
- Industrial properties:
  - *Patent.* Protects new inventions that represent concrete solutions to a technical problem, and where the solution is also of a technical nature. The deductible is valid for 20 years. Medicines and herbal pharmaceutical products can be extended to 25 years). Legally regulated by the Patent Act.
  - *Trademark*. Features of goods and services. All kinds of characters but must be able to be given graphically. Valid for 10 years, can be renewed indefinitely. Legally regulated by the Trademark Act.
  - *Design rights.* Protects the visible design of a product for up to 25 years. Legally regulated by the Design Act.
- *Copyright.* Literary, scientific, or artistic works, associated with the author and last 70 years after his death. Legally regulated by the Copyright Act.

FoU = Research and Development (R&D)

8.2 Process

Step 1: Idea registration

We receive an idea and review it in the first instance with the idea holder / researcher. We make an initial assessment of the idea and possibly agree that a message is delivered in the form of a DOFI (Disclosure of Invention). You get a DOFI form from us, and we give advice on filling it out. DOFI is delivered to Nord innovasjon AS, and is valid when it is approved and signed by both parties.



Step 2: Clarification of ideas

Delivered DOFI is the starting point for formal work with the idea, and for assessing the role of Nord innovation further in the project, on behalf of Nord University. A closer assessment is made of the technology's maturity and potential, needs, market, opportunity for intellectual protection (patents, etc.), competing solutions / patents ("freedom to operate"), development processes and costs. If we decide to take the idea further, an agreement will be established between the inventor and Nord innovasjon AS.

Step 3: Concept clarification

The further development involves completing a theoretical evaluation of the idea / technology, developing a strategy for protection (IPR) and possibly implementing this (e.g. patenting), assessing different business models and organizing the further work. We are seeking funding for further development of the idea, including funds for intellectual protection of the invention (patents, etc.).

Step 4: Verification

The idea is made ready for commercialization. This is done by verifying technology on a larger scale together with the team and any external partners. Furthermore, the market and willingness to pay are verified, and a strategy is developed for sales, market, financing, and any external ownership / investors.

Step 5: Commercialization

A plan for the actual commercialization is developed and realized, e.g. in the form of a new establishment (spin-off), licensing, or sale of the technology (exceptional). We develop models that ensure that researchers and the research environment receive their share of future income from the invention.

Step 6: Exit

8.3 Regulatory Frameworks in NO

8.3.1 Laws and legal frameworks

Employees' Inventions Act[1]

- The Act was amended in 2003 to allow universities and university colleges to transfer the rights to commercialize research results from their research employees.
- Relevant sections:

  § 4. If the invention is a direct result from a task assigned by the employer, the employer is entitled to demand part of or all rights to be transferred if exploitation of the invention falls under the employer's area of business.

  If the invention does not have a connection to the employment relationship but falls under the employer's area of business, the employer shall seek an agreement with the employee over rights within 4 months after notification of the invention.

  § 5. An employee who makes an invention that is covered by the provisions of Section 4 shall, without undue delay, notify the employer in writing about it, specifying the nature of the invention.

  § 12. Any dispute arising from matters covered by this Act may be referred to a mediation board by either of the parties.

The Norwegian Patents Act[2]

- To obtain a patent the invention must solve a technical problem in one new way, which differs significantly from what is known from before. A patent can last for up to 20 years from the day the application was sent, and the holder must pay annual fees to keep the patent at bay.
- Relevant sections:

  § 1. Inventions are considered to be:
  - discoveries, scientific theories and mathematical methods,
  - artistic creations,
  - plans, rules or methods for the exercise of intellectual activity, for games or business activities, or programs for computers.
  - presentation of information.

  Inventions can also be patented in relation to a product which consists of or contains biological material, or a method for producing, treating or using biological material.

  § 1 b. Patents are not granted if commercial exploitation of the invention would be contrary to public policy or morality.

---

[1] Employees Inventions Act [Arbeidstakeroppfinnelsesloven]. (1970). Lov om retten til oppfinnelser som er gjort av arbeidstakere (LOV-1970-04-17-21). Lovdata. ENG:https://www.patentstyret.no/en/services/patents/Rules-and-regulations-patents/employees-inventions-act/

[2] Patentforskriften. (2007). Forskrift til patentloven (FOR-2007-12-14-1417). Lovdata. ENG: https://www.patentstyret.no/en/services/patents/Rules-and-regulations-patents/patent-regulations/

The Norwegian Patents Act [Patentloven]. (1967). Lov om patenter (LOV-1967-12-15-9). Lovdata.

ENG: https://www.patentstyret.no/en/norwegian-patents-act

No patent can be granted for

- procedures for cloning humans,
- methods for altering the genetic identity of human gametes,
- Use of human embryos for industrial or commercial purposes; and
- methods for altering the genetic identity of animals which may cause them disorders without causing any significant medical benefit to humans or animals, as well as animals produced by such methods.

§ 3. The exclusive right obtained by patent means that others than the patent holder must not, without his consent, utilize the invention by:

1. manufacture, offer, place on the market or use a product which is protected by the patent or to import or possess the product for such purpose,
2. apply or offer to apply a method which is protected by the patent or, if he knows or it is obvious from the circumstances that the method must not be used without the consent of the patent holder, offer it for use in this realm,
3. offer, market or use a product manufactured through a patent-protected process, or introduce or possess the product for such purposes.

§ 6. An application for a patent for an invention which, at the earliest twelve months before the date of application, is specified in an application for a patent in this country or for a patent, inventor's certificate or use pattern protection in a foreign state acceding to the Paris Convention of 20 March 1883 for industrial property protection to § 2 first, second and fourth paragraphs as well as § 4, is considered submitted at the same time as the previous application, if the applicant so requests.

§ 8. An application for a patent is submitted in writing to the Norwegian Industrial Property Office or, in the case referred to in Chapter 3, to the patent authority or international organization as specified in section 28.

§ 22. From the day on which the patent is granted, all documents in the case must be kept available to everyone.

When eighteen months have elapsed from the filing date of the application, or, if priority according to § 6 has been requested, from the day from which the priority has been requested, the documents shall be kept available to anyone even if a patent has not been granted.

§ 28. An international patent application is an application filed in accordance with the Convention on Patent Cooperation adopted in Washington on 19 June 1970 (the Cooperation Convention).

§ 43. If the patent holder has granted another right to exploit the invention (license) for business or operational purposes, he may not transfer his right to others unless otherwise is or must be considered to have been agreed.

The Norwegian Trademark Act

The Norwegian Design Act

- Legislates the visible design of a product for up to 25 years.

The Norwegian Copyright Act[3]

- A literary or artistic work that is an expression of original and individual creative effort, receives protection under copyright (including scientific publications and teaching materials).
- Under the jurisdiction of the Ministry of Culture and Equality. No application,
- Creative rights generally fall under the Copyright Act rather than the Employees Inventions Act, particularly teaching materials with a personal connotation.

The Norwegian University and University Colleges Act[4]

- Legislating the University's assignment and responsibility to facilitate innovation.
- Relevant sections: § 1-3.

The EEA Agreement – Annex XVII on Intellectual Property[5]

- Directive 2009/24/EC on the legal protection of computer programs[6]
- Directive 96/9/EC on the legal protection of databases[7]
- Directive 2001/84/EC on the resale right for the benefit of the author of an original work of art[8]
- Directive 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society[9]
- Directive 2006/116/EC on the term of protection of copyright and certain related rights[10]
- Directive 2006/115/EC on rental right and lending right and on certain rights related to copyright in the field of intellectual property[11]

---

[3] The Norwegian Copyright Act [Åndsverkloven]. (2018). Lov om opphavsrett til åndsverk (LOV-2018-06-15-40). Lovdata. https://lovdata.no/dokument/NL/lov/2018-06-15-40/

** No ENG version available. Refer to EEA Agreement Annex XVII.

[4] The Norwegian University and University Colleges Act [Universitets- og høyskoleloven]. (2005). Lov om universiteter og høyskoler (LOV-2005-04-01-15). Lovdata. ENG: https://lovdata.no/dokument/NLE/lov/2005-04-01-15

[5] Annex in Council of the European Communities., & Commission of the European Communities. (1992). Agreement on the European Economic Area. Luxembourg: Office for Official Publications of the European Communities. https://www.efta.int/media/documents/legal-texts/eea/the-eea-agreement/Annexes%20to%20the%20Agreement/annex17.pdf

[6] Directive 2009/24/EC. *The legal protection of computer programs*. European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2009/24/oj

[7] Directive 96/9/EC. *The legal protection of databases*. European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/1996/9/oj

[8] Directive 2001/84/EC. *The resale right for the benefit of the author of an original work of art*.

European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2001/84/oj

[9] Directive 2001/29/EC. *The harmonisation of certain aspects of copyright and related rights in the information society*. European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2001/29/oj

[10] Directive 2006/116/EC. The term of protection of copyright and certain related rights (codified version). European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2006/116/oj

[11] Directive 2006/115/EC. Rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version). European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2006/115/oj

- Directive 2012/28/EU on certain permitted uses of orphan works Text with EEA relevance[12]

- General influential frameworks:
    - World Intellectual Property Organization (WIPO) administered treaties:
        - Berne Convention for the Protection of Literary and Artistic Works (1886)
            - Universal Copyright Convention revised in the Paris Act (1971)
        - Paris Convention for the Protection of Industrial Property (1883)
    - World Trade Organization (WTO):
        - Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) (1995)

8.3.2 Policy frameworks

Ministry of Education and Research - "Long-Term Plan for Research and Higher Education 2015-2024"13

Government strategy document:

- 6 long-term priority areas (ten-year perspective):
    - Seas and oceans
    - Climate, environment and clean energy
    - Public sector renewal, better and more effective welfare, health and care services
    - Enabling technologies
    - Innovative and adaptable industry
    - World-leading academic groups

"Effects on horizontal co-ordination, including the high-level meetings chaired by the prime minister, Cabinet discussions on STI issues, the establishment of some interdepartmental steering groups at administrative and political level, alignment work in RCN and other soft co-ordination questions" (OECD, 2017, p. 44).

Ministry of Trade, Industry and Fisheries

1. "Unique Ideas, Major Assets" (2012-2013)[14]
   Report to the Storting. Policy framework and future vision for innovation.
    - Government policy for IPR
        - Vision: "One holistic business policy"
        - Government mission to to promote awareness and competence about and increase the strategic use of intellectual property rights in Norwegian business, the public sector and among other relevant actors:
            - Join Norway to international agreements and update regulations and schemes.
                - Joined European Patent Convention (EPC) in 2008, European Patent Office (EPO) (London Agreement), Nordic Patent Institute (NPI), joined the Haag system for design registration in 2010 (Genèva Agreement).

[12] Directive 2012/28/EU. *Certain permitted uses of orphan works Text with EEA relevance.* European Parliament, Council of the European Union. https://eur-lex.europa.eu/eli/dir/2012/28/oj

[13] Meld. St. 7 (2014-2015). *Long-Term Plan for Research and Higher Education 2015-2024*. Ministry of Education and Research.

[14] Meld. St. 28 (2012-2013). *Unique ideas, major assets.* Ministry of Trade and Industry.

- Improve training in intellectual property and rights.
- Further develop the Norwegian Industrial Property Office.
- Further develop the overall guidance offer within intellectual property and rights.
- Fight piracy and counterfeiting.
- Improve the knowledge base for further policy development.

2. "The health industry: Working together on value creation and better services" (2018-2019)[15]
    - Stating the health innovation ecosystem, focus on clinical trials in assisting research innovation in the public health sector.
    - Norwegian Association of Local and Regional Authorities Innovation Barometer findings:
        i. Innovation in the municipal sector does not depend on experts or enthusiasts alone, the employees have a positive role when it comes to initiating and implementing innovation.
        ii. Companies that allow employees to work innovatively achieve greater employee satisfaction and higher quality and efficiency in service delivery.
        iii. Municipal leaders are a source of inspiration, they are important for prioritizing resources for innovation work and providing space to try out new solutions.
        iv. Organizational culture also plays a very important role; risk-taking, openness, recognition and cooperation provide several new solutions.

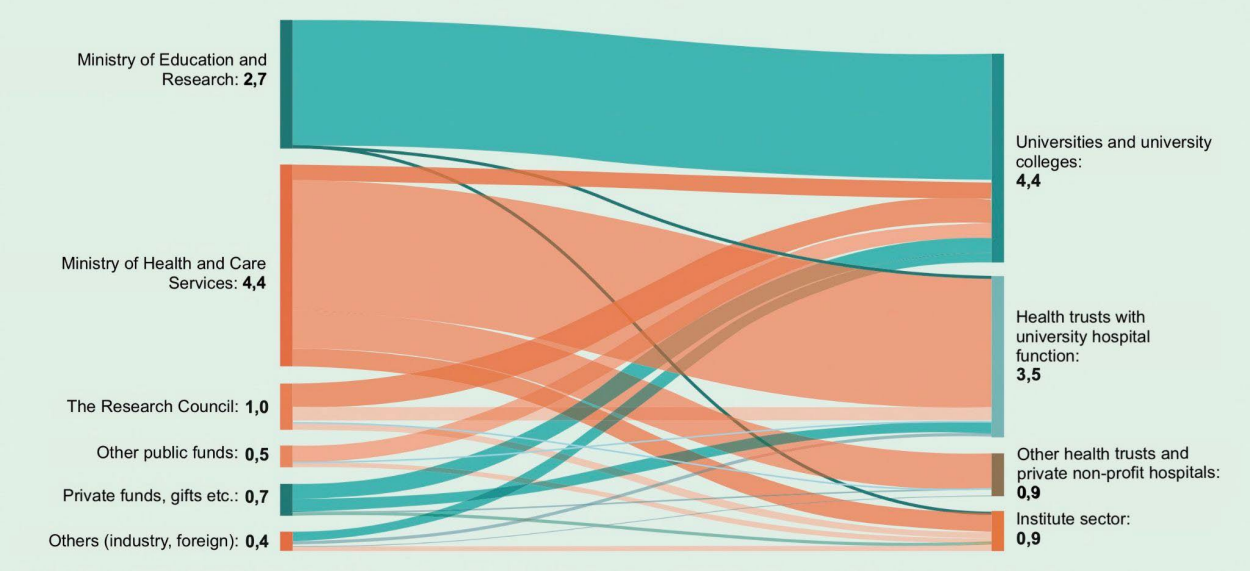


Figure 31 Total expenditure on R&D in medicine and health sciences by source of funding (left side) and recipient (right side). Figures for 2017, in billion NOK.

8.4 4. Organization in NO

- External model:
    - Operates as an independent company, separate from the university central administration, but all TTOs have varied models of ownership
    - Threefolded system: Institution, Researcher and TTO

[15] Meld. St. 18 (2018-2019). *The health industry: Working together on value creation and better services.* Ministry of Trade, Industry and Fisheries.

        - Future net income from a successful commercialization is normally split in three with 1/3 to the researcher, the University the TTO.
    - Some universities (UiO, UiS) have established internal innovation units to clear up the division of labor between the university and TTO's.
    - Different roles:
        - Some TTO's actively manage the university's IPR (UiO, NTNU, Nord) while some TTO's only have an advisory role.
    - No basic financing of daily operations. The TTO in itself is meant to be self-financed.
        - Services are funded through service purchase or collaboration agreements with the R&D institutions, project funding through FORNY (Research Council) or through own funds.
- Support systems:
    - The Research Council of Norway
        - Subject to the Ministry of Education and Research
            - Supplemented funding by
              Ministry of Trade, Industry and Fisheries,
              Ministry of Health and Care Services,
              Ministry of Finance,
              Ministry of Labour and Social Affairs,
              Ministry of Justice and Public Security,
              Ministry of Climate and Environment,
              Ministry of Local Government and Regional Development,
              Ministry of Agriculture and Food,
              Ministry of Petroleum and Energy,
              Ministry of Transport, and
              Ministry of Foreign Affairs
        - Approve funds to the TTO's through the FORNY program
            - TTO's can on behalf of the researcher apply for individual project funding through the Commercialization Project (fund pool for 2022 approximately 245 mill NOK)
            - Approval based on the Technology Readiness Level (TRL) scale, approves projects from level 2-7 (see Horizon2020).
            - Criteria for funding:

                1. *Research and innovation.* What has been done ahead of the project? Does it have a good starting point?
                2. *Impact and effects.* What can happen after this project? Is the project commercially interesting and can contribute to value creation?
                3. *Implementation.* What will happen after the project? Will what is to be done in the project help to trigger the next step in the commercialization process?

    - Innovation Norway
        - Provide tools for start-ups and spin offs
        - Councils IPR and license agreements, cooperates with the NIPO
    - Norwegian Industrial Property Office
        - Application for licenses, patents
    - SIVA

- Types of research organizations in NO:

- Universities, specialized university colleges and university colleges accredited at the institution level by the Norwegian Agency for Quality Assurance in Education (NOKUT).
- Research organizations encompassed by the Norwegian guidelines for public basic funding of research institutes. Two types:
  - Centers for Research-based Innovation (SFI)
    - An SFI can be hosted at a university, university college, research institute or an enterprise.
    - Aim: supporting business sector innovation through collaboration between research-intensive firms and research institutions.
  - Centre of Excellence (SFF)
    - Innovative and potential for delivering groundbreaking results that move the international research front.
    - As of 2019, there are 23 SFFs in Norway.
- Health trusts/hospitals with legally mandated research and development tasks and private, nonprofit hospitals that are encompassed by the national system for measuring research activity under the Ministry of Health and Care Services.
- Other approved research organizations that have research as an objective and have been assessed and approved in accordance with the definition of research organization in the state aid rules.

- Advantages to the system:
  - Regional presence to establish horizontal network
  - "Arms length distance" from university control allows for closer network in business sector
  - Universities are protected against individual lawsuits due to external TTO system
  - TTO mission and tasks free and not limited to public sector
- Challenges:
  - Structural distance to university unclear for TTO
  - No innovation culture in research environments at universities
  - Different measurements of results
  - Lack of formal and informal contact with researchers and innovation units at Universities
  - Lack of cooperation between TTO's due to state aid regulations limiting mutual service purchasing between TTO's

8.5 5. TTO's in NO

TTO	Public/private ownership	Focus areas	Projects
Inven2	Public	Clinical studies	*Portfolio businesses (55 total):*
		Digitalization and e-health	Nykode Therapeutics
		Life Cycle Management	- development of novel vaccines
		Technology	Nordic Nanovector
			- tumor targeted antibody based nanovector
			Elliptic Labs
			- creating intuitive ways of interacting with computers.
			EPiGuard

			- develops improved patient transport solutions
			Current Eco
			- Smart Urban Mobility Platform for real time information
			Products:
			- EPISHUTTLE – Transport isolator
			- QUEST 5 HMC DNA ELISA KIT Epigenetic kit
			- PROBNP – Heart disease test
			- Medical Thermo Band
			- INNER BEAUTY - Virtual proximity sensor for mobile
			- PROMON SHIELD - Proactive software
SINTEF TTO	Private (foundation)	Safeguard SINTEF's intellectual property rights (IP)	*Portfolio businesses (spin offs):*
			BioEnivison
			- Flame retardants, water-repellent and barrier materials and antifouling solutions.
			Biosergen
			- developing new drugs based on cutting edge biosynthetic engineering of natural products, combined with chemical synthesis.
			SpinChip Diagnostics
			- art platform for in vitro diagnostics point of care analyses
			C-Feed
			- produces copepod eggs and live copepods for early stage feeding of marine fish, crustaceans and other marine organisms.
			Zivid: real-time 3D camera.
			SonoClear®
			- an acoustic coupling fluid for enhanced ultrasound imaging
			sensiBel
			- MEMS-based microphone technology for speech recogniton applications.
			Tellu
			- IOT cloud solution for health- and personnel safety applications.
			Minuendo: lossless earplugs.
			Nisonic
			- ultrasound based measurement of intra-cranial pressure.
			Ocean Space Acoustics

			- provider of PingMe - a semi-active transponder for location transmitting signals subsea to surface.
			NoMono AS
			- audio capture platform for object-oriented audio formats
			Visavi Technology AS
			- software solution - LivePlan; a tool for lean planning and integrated operations for complex organisations.
			KIT AR Ltd
			- Mixed Reality solutions for advanced manufacturing processes in robotics, aerospace and automobile industry.
			HyStar AS
			- electrolyzers for large scale and 100% sustainable green hydrogen production.
			HYDROGEN Mem-tech AS
			- production of hydrogen
			Aidee Health AS
			- deliver medical grade continuous blood pressure monitor.
Kjeller Innovation AS	Public/private	Energy	Eclectic
		Space technology	- cloud-based service for the handling of sensor-derived data for the measurement of air quality in cars
		Bioeconomy	IMIRO
		Smart societies	- measuring hydrocarbons/PAH in water.
		Mobility	Previwo AS
			- Developing vaccines against winter ulcer and other related diseases in salmon.
			Sensilist
			- method for precise detection of Listeria.
			SiliconX
			- new material that can save five times more energy than the material used in today's lithium batteries.
			SuperCap
			- new technology that can store five times more energy than today's state of the art.
			Target

			- development of targeted fish vaccines based on a vaccine platform.
NTNU Technology Transfer AS	Public	Sustainability	Sky Axxel
		Energy	- Magnetic skyrmions as information carriers for high-density, low-power memory devices.
		Sea	Health status measurement in Atlantic salmon parr
		Health	MARC: Multi-purpose optical sensor
			Pelton turbine wear monitoring
			Prediction of migraine attacks with AI
			INSTA-patch & INSTA-app:
			- sensor for monitoring of vital parameters
			Production of uniform populations of gel microbeads
			Novel membrane for blue hydrogen production
			AiBa
			- Real-time, continuous, multimodal detection of sexual predators online
			Dokka Smart Bolt
			- Surveillance of bolts in wind turbines
			SiQua
			- process for recycling of used quartz crucibles
			The Fitness Calculator
			- algorithm to estimate the fitness age of a human body.
			In-Motion
			- AI-based medical tool for prediction of Cerebral Palsy in infants
			Revie
			- novel drug for osteoporosis
			Rock Burst Bolt
			- rock bolt for use in areas prone to rockburst
Norinnova AS	Public/private	Technology	*Startup companies:*
		Energy, climate, environment and society	Keenious
		Sustainable use of resources	- algorithm analyzing the text you write
		Social development and democratization	Pazzing
		Health, welfare and quality of life	- platform where mobile players work together to solve challenges and tasks within a given time limit.
			Probotic

			- autonomous, environmentally friendly solution in the field of washing farmed snow
			Medsensio
			- smart algorithm based on machine learning that automatically detects and interprets noises in the lungs.
			Chip NanoImaging
			- photonic chip-based micropscopy solution with super-resolution (nanoscopy)
			Recogni
			- Using data sources such as ocean currents, wave height, engine use and ballast, provides a tool for making the crew of ships operate as efficiently as possible and reduce fuel consumption.
			Eupnea
			- sensor for measuring respiratory frequency.
			Unifractal
			- tool that recognizes technical equipment using the camera on your smartphone.
			Sonomatrix
			- new technology for use in ultrasonic systems.
			The Health Book
			- app developed by Norwegian doctors aims to make everyday life easier for both patients and healthcare professionals.
VIS Vestlandets Innovasjonsselskap AS	Public	Marine	Development of a novel natural product platform for unmet medical needs.
		Life Science/Health	Deciphering molecular mechanisms in CNS disease.
		Society	Pill-like device for collecting intestinal fluid samples.
		Deep tech	ETEC Vaccine for Traveler's Diarrhea.
			Canine-assisted profiling of lung cancer from human breath.
			SmoltVision
			- analytical tool to make it easier for the fish farmer to time smolt release.
			XSENS
			- Fuel meter helps reduce CO2 and SOx emissions
			Fiber Optic Tunnel Surveillance
			Industrial diamond reactor
			- Producing lab-grown diamond jewellery and diamond semiconductors.
			4-day treatment of OCD.

			Continuous Laryngoscopy Exercise Test (CLE).
			eMeistring – Online supervision of mental illnesses.
			Psychological First Aid Kit – Conceptualising feelings.
Validé AS	Public/private	Agriculture	HuddleStock, Shoreline, Factiverse, Saferock, Typhonix, Scale Protection AS, SurplusHub International, Foodback AS, From victim to warrior AS, Factiverse
		Aquaculture Biotechnology Construction	
		Food	
		Energy	
		Health	
		Technology	
		Life Sciences	
		Materials science Medical products and software.	
Ard Innovation AS	Public	Environment Sustainable development	IsDeCa- Industrial Mixer
		Better public and animal health	CystLab
		Climate challenges Renewable energy sources	- remove parasitic potato cyst nematodes (PCN)
		Food production and land and resource management.	Microboost
			- delivery of environmentally friendly alternatives to chemical pesticides, probiotics and sustainable alternatives
			CIOL® wood
			- wooden material with protection and durability based on an environmentally friendly process with inexpensive ingredients.
			BacPress
			- packaging technology against Listeria
			EpiWHey
			- method for value creation from by-products in the dairy industry
			Urban Living Laboratory
			InSacco
			- system for environmental monitoring of the aqueous environment.
			SmartForest
			- SFI for forest technology sector
			Marine innovation arena
			Food Inspector
			- tools for the effects storage has on meat quality
Innoventus Sør AS	Public/private	*NA*	Aersea AS

			- Air and underwater drone services.
			Aliva AS
			- Apparatus for automatic treatment of dry mouth.
			Bitmesh AS
			- IoT platform for Smart Builds.
			Bon Vivant AS
			By Bente
			- Professional hair color for home use.
			Cleanfish equipment
			Oripatch AS
			- Focused pain relief
			Uveil
			- Airbnb-inspired platform for locations to the photography and film industry.
Nord Innovation AS	Public	Blue and green growth	*NA*
		Sustainable innovation and entrepreneurship	
		Health, welfare and upbringing	
		Social security	

8.6 Case Study of University of Oslo (UiO)

8.6.1 IPR policy (University of Oslo, 2011)

Overview of legal bases for rights to results

- Under the Norwegian Copyright Act, the University of Oslo has rights to catalogues, databases, etc., the development of which the University of Oslo has invested in, and to software created by employees during performance of tasks assigned as part of their employment or according to the employer's instructions.
- For results other than those mentioned above, the general rule is that the employee owns the results of their work, for example, articles or books that under the provisions of the Copyright Act the author owns the rights to.

Overview of results covered by the University of Oslo's IPR policy:

- When notifying Inven2 AS of an invention, an employee may point out that he or she will exercise his or her right to publish the invention without awaiting the University of Oslo's assessments, but notification of the invention must be submitted anyway.
- The following categories of results are covered by the University of Oslo's IPR policy, but are not subject to an obligation to notify Inven2 AS:
    - Scholarly articles
    - Teaching materials
- As only physical persons can create intellectual property, it will almost always, with a few exceptions, be the employee who is entitled to the copyright to results created as part of the University's activities.

Patentable inventions

- Pursuant to Section 6 of the Employee Invention Act, employees at the University of Oslo may nevertheless choose to publish their results rather than patenting. In such cases, at the time of notification, the employee must state explicitly that he or she will go ahead with publication regardless. Otherwise, manuscripts must not be offered for publication until a patent application has been filed, unless this has been approved beforehand by the University of Oslo through Inven2 AS. Once a patent application has been submitted, the employee is free to publish the invention, e.g., as a lecture or as part of a scholarly publication, as described in the patent application and in consultation with Inven2 AS.

Special rules for research funded by the EU or the Research Council of Norway

- The standard conditions of contract for projects funded by the Research Council of Norway and the EU go even farther than the law; these contracts state that all research results, and the rights connected to them, are the property of the University of Oslo.

Distribution of net earnings using the tripartite principle

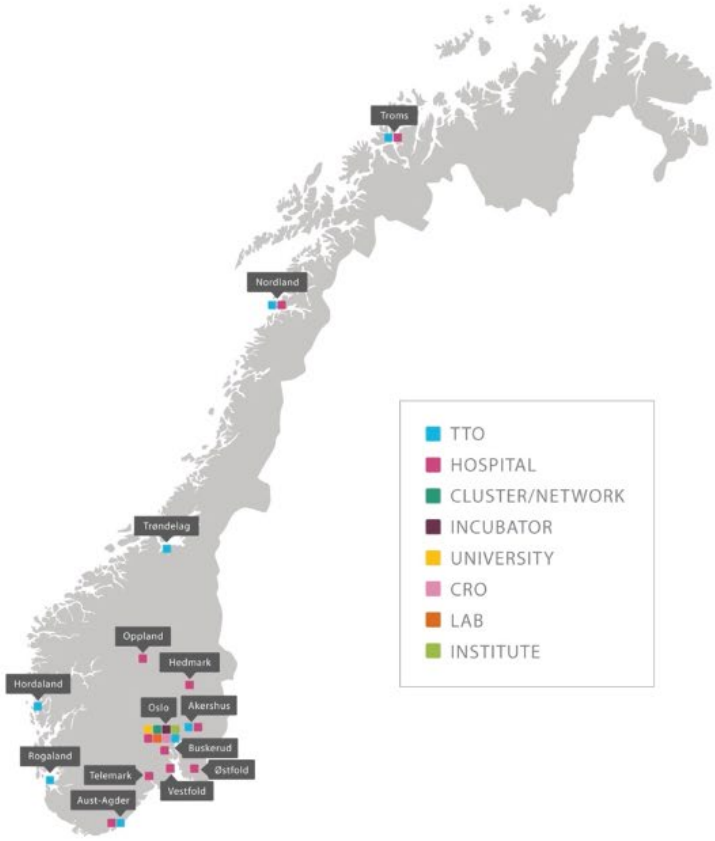
- After deduction of Inven2 AS's documented costs for commercialization, the net earnings are split three ways, with a third going to the inventor (employee), a third going to the University of Oslo and a third going to Inven2 AS.

8.6.2 Inven2

Responsibilities (according to IPR policy of UiO):

1) Assist the University of Oslo in its efforts to strengthen the culture for innovation and contact with industry at the University of Oslo and help promote the University in the field of innovation and commercialization of research findings.
2) Process reported ideas (Disclosure of Invention; DOFI) by means of identification, registration, assessment of commercial potential and choice of IPR strategy, and obtain copyright protection in cases where this has been deemed appropriate. This work also includes a duty to provide written feedback to inventors concerning whether Inven2 AS is going to set up a project based on the submitted DOFI. This feedback should normally be given within two months of receipt of the DOFI.
3) Perform innovation and commercialization tasks, including copyright protection and business development in accordance with the University of Oslo's IPR policy.
4) Commercialize the results of work and research that the University of Oslo has rights to and that has commercial potential, including negotiating, entering into and following up agreements with third parties in innovation and commercialization projects. Once written feedback as specified in item b above has been given, Inven2 AS shall prepare a project plan that will normally include a summary of milestones related to technical development, copyright protection and commercialization.
5) Be responsible for the project with regard to applying for funding from appropriate sources of funding for development of innovation and commercialization projects.
    - On behalf of the University of Oslo, Inven2 AS makes decisions concerning patenting, licensing and setting up companies, and negotiates and signs agreements with third parties on matters relating to the University of Oslo's rights to results obtained at the University. Inven2 AS manages the University of Oslo's ownership and rights once agreements have been entered into and is the University of Oslo's point of contact with external parties in matters linked to the management of the University's rights, for example in connection with due diligence, unless the contract indicates otherwise.

- Articles of Association for Inven2 AS of 21 April 2010 and the Management Agreement between the University of Oslo and Inven2 AS of 8 June 2010.



TROMS
- Norinnova Technology Transfer
- University Hospital of North Norway

NORDLAND
- Nord Innovation
- Nordland Hospital

TRØNDELAG
- NTNU Technology Transfer
- SINTEF TTO

HORDALAND
- VIS

ROGALAND
- Validé

AUST-AGDER
- Innoventus Sør
- Sørlandet Hospital Trust

OPPLAND
- Rheumatism Hospital

HEDMARK
- Innlandet Hospital Trust

ØSTFOLD
- Østfold Hospital Trust

BUSKERUD
- Vestre Viken Hospital Trust

TELEMARK
- Betanien Hospital
- Telemark Hospital Trust

VESTFOLD
- Vestfold Hospital Trust

OSLO
- Oslo University Trust
- Aker University Hospital
- Diakonhjemmet Hospital
- Lovisenberg Hospital
- OUS: Norwegian Radium Hospital
- OUS: Rikshospitalet
- OUS: Ullevål University Hospital
- Sykehuspartner Trust
- Hospital pharmacy enterprise
- ShareLab
- SINTEF & UiO: MiNaLab
- UiO: Department of Informatics
- UiO: Life Science building
- University of Oslo
- Oslo Cancer Cluster
- Norway Health Tech
- Norwegian Inflammation Network
- Nansen Neuroscience Network
- The Life Science Cluster
- Oslotech
- Aleap
- Oslo Cancer Cluster Incubator
- StartupLab
- Catapult Life Science
- Inven2
- Sintef

AKERSHUS
- Kjeller Innovation
- ARD TTO (NMBU)
- Akershus University Hospital
- Sunnaas Hospital Trust
- Martina Hansens Hospital

Figure 32 Norway Innovation Ecosystem (Inven2)

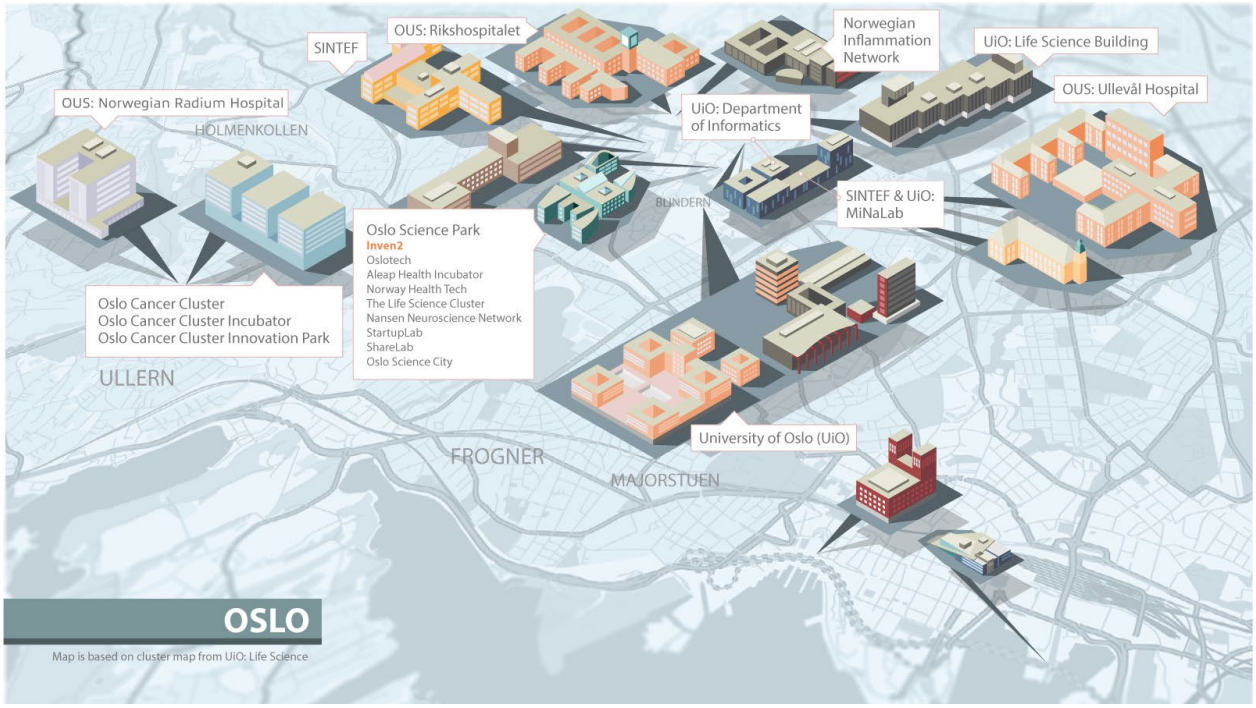


Figure 33 Map of Oslo Science Center

8.6.3 Oslo Science Park

- Houses clusters, networks and research environments (also houses Inven2)
- Academic focal points: ICT, mobility, media knowledge, life science, health, climate, environment, energy and nanotechnology.
- Main initiatives:
    - Incubator StartupLab
    - Healthincubator Aleap
    - Biotechincubator ShareLab
    - The Life Science Cluster
    - Norway Health Tech
    - Life Science Growth House
        - Will help researchers and students in life sciences to mature early-stage ideas to facilitate that research results to a greater extent benefit society.
        - Will eventually move into the Life Science Building. Now the unit is located in Oslo Science Park.
        - Is an equal collaboration between the Faculty of Mathematics and Natural Sciences and the Faculty of Medicine.
        - Support from: UiO and UiO:Life Science.

8.6.4 UiO Interdisciplinary Strategic Priority Areas

UiO: Life Science

Develops knowledge in the life sciences by combining medicine and biology with methods of analysis from disciplines such as mathematics, chemistry, pharmacology, physics and computer science. Life Sciences represent a platform for new industry in Norway and transition to a greener economy with new jobs, products and services for the benefit of society, particularly in the health sector.

Projects:

- SPARK Norway:

- Two-year program for researchers in Life Sciences. Recieve guidance from mentors from academia, hospitals, industry and venture companies, milestone-based funding, counseling and training. Led by UiO:Life Sciences, partnering with Inven2, Oslo University Hospital and clusters.

UiO: Energy

Main research fields:

- Energy Transition and Sustainable Societies
- Carbon Capture and Storage
- Energy Systems
- Materials for energy

Projects:

- SPARK Social Innovation Norway: Two-year program developed with inspiration from SPARK Norway for social sciences.

UiO: Democracy

Previously UiO:Nordic. Five focus areas:

1. Institutions of democracy
2. Citizenship
3. The role of knowledge
4. Crisis management
5. Democracy in everyday life

The perspectives of sustainability, globalization and digitalisation will characterize the investment as a whole.

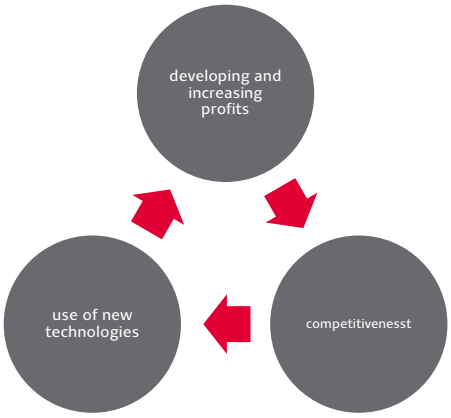
- *Aim:* To strengthen the democratic culture through interdisciplinary research and teaching, but also by seeking comprehensive social participation.
- coming in 2023. Replaces UiO:Norden

9 The impact of innovation on firm development

Ing. Petr Očko, Ph.D.

Innovation is the basis for the growth and development of enterprises to ensure strategic competitiveness. Until recently, it was common for companies to carry out their development processes by relying exclusively on internal resources, following a model based on the concept of 'closed innovation'. This model considers the enterprise as an integrated system in which innovation activity depends on internal research and development (R&D). As such, the enterprise operates as a separate entity that follows the steps leading to the production and marketing of its products and services.
In the previous decade, the literature has shifted from closed innovation, where knowledge and technology are developed internally by the firms themselves and innovation processes take place exclusively within the firm, to open innovation, where it is recognized that innovative ideas and knowledge flow spontaneously both internally and externally, and where there is a strong dynamic of collaborative consortia.
Since 1989, after the fall of the Iron Curtain, and especially during the last 20 years, foreign direct investment and related production and services have played a significant role in the transformation of the Czech economy, taking advantage of the favourable geographical location of the Czech Republic, its proximity to the core of the EU common market and sufficient infrastructure. Thanks to a combination of these factors, but also thanks to the tradition of many industries, the Czech Republic is one of the most industrialized countries in Europe.
It is a fact that innovation plays one of the important roles in introducing any innovation to existing product lines or set processes, leading to increased market share, increased revenue and ultimately increased customer satisfaction. Innovation is also a tool used to modernize the operating systems of various companies or to introduce modern automation technologies.
Innovation is necessary in all areas of society and serves and helps to overcome the challenges that come globally. The implementation of innovations that significantly support growth is directed towards the development of companies, society and increasing competitiveness. The use and implementation of innovations also leads to the strengthening of economic growth.

The impact of innovation on firm development



Elaborated by: Očko, 2023

Gradual strengthening of these segments of the economy, which are based on innovation and on a greater role for the Czech domestic business sector, is probably still necessary for the further growth of the Czech economy.

In terms of internal factors to support the development of a creative environment and innovation within the company, one of the most crucial factors is the continuous promotion of a culture of innovation and integrity within the company itself. Identify ongoing changes, challenges, needs and ideas, sides of your employees and communicate them. Then create a validation process for those ideas. The moment an assumption is validated, it is time to proceed with the implementation and realization of putting the idea into practice. Subsequently, the benefits will need to be monitored through established parameters and a value scale.

A suitable way to grasp the issue is to categorize the corporate environment according to innovation performance. A key analytical input in this area in the Czech Republic in recent years is the methodology of innovation capacity analysis "INKA" implemented by a consortium of institutions led by the Technology Agency of the Czech Republic.

Among other things, this methodology enabled us to categorize companies in the Czech Republic according to their approach to innovation. According to this study of the Technology Agency of the Czech Republic, the basic types of firms are as follows:

"1. **Global Innovation Leaders** These are independent firms with a global footprint that also aspire to be global leaders of change in their product markets.

2. **Global followers These are** companies with a global presence with aspirations of succession. It also includes some firms that are part of foreign concerns. But only those of them that are themselves responsible for both marketing and selling their own products in global markets.

3. **Regional challengers** Firms operating in many countries, often on multiple continents, but falling short of global reach, with the innovative aspirations of a leader or follower.

4. **New firms with high innovation aspirations** A group of (post)startup firms with the innovation aspiration of a global leader or follower.

5. **Local optimizers** Mature companies operating locally with aspirations to follow or optimize established products. This also includes firms with a regional presence setting a basic innovation aspiration falling into the optimizer category.

6. **Global pioneer** Companies trying to find niche markets with less competition, pursuing completely new solutions and with a global reach.

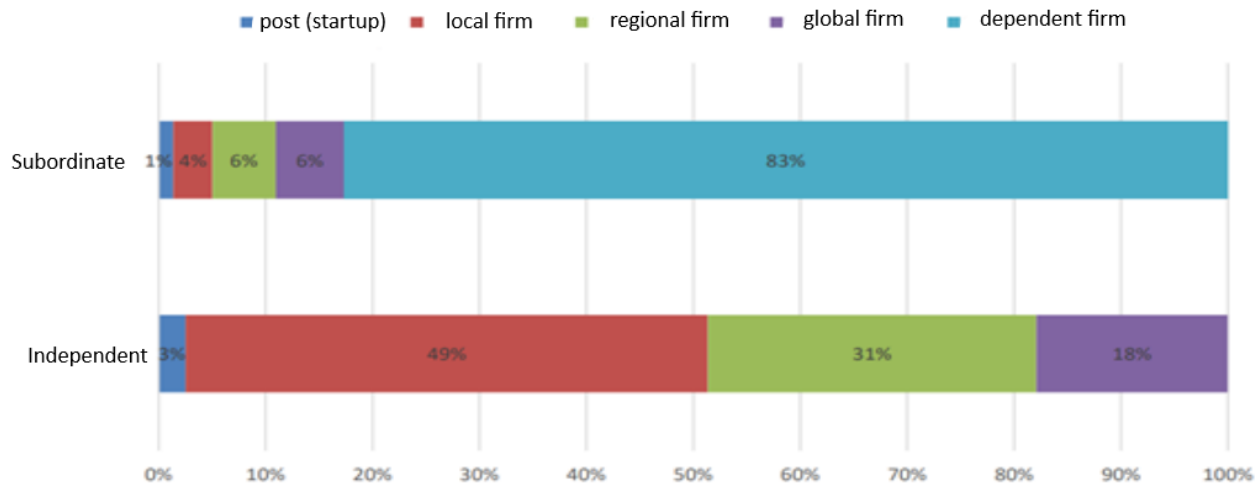
7. **Local pioneer** Companies with the motivation to seek unique solutions with little competition but operating in local markets. They have the ambition to seek and create new products but lack the ambition to seek and operate in regional and global markets.

8. **Firms providing partial corporate functions** This group includes all firms that are part of (mostly foreign) concerns and perform various corporate functions for them that are entrusted to them from higher decision-making levels of the concern."

According to the INKA study, the key division of companies is also according to the extent to which they are dependent on and able to implement their own development strategy, or so-called upgrading, which is a desirable activity of all open economies with a high share of foreign capital.

The results from the verified firms in terms of their structure according to the degree of dependence, nature according to ambition, market position, and performance and export development are unambiguous. The vast majority of firms visited fall into the category of independent firms, i.e. firms that are not dependent on a parent organization (non-autonomous) or in the value chain (autonomous).

Chart 23: Position of firms according to their dependence on the market, 2017-2018



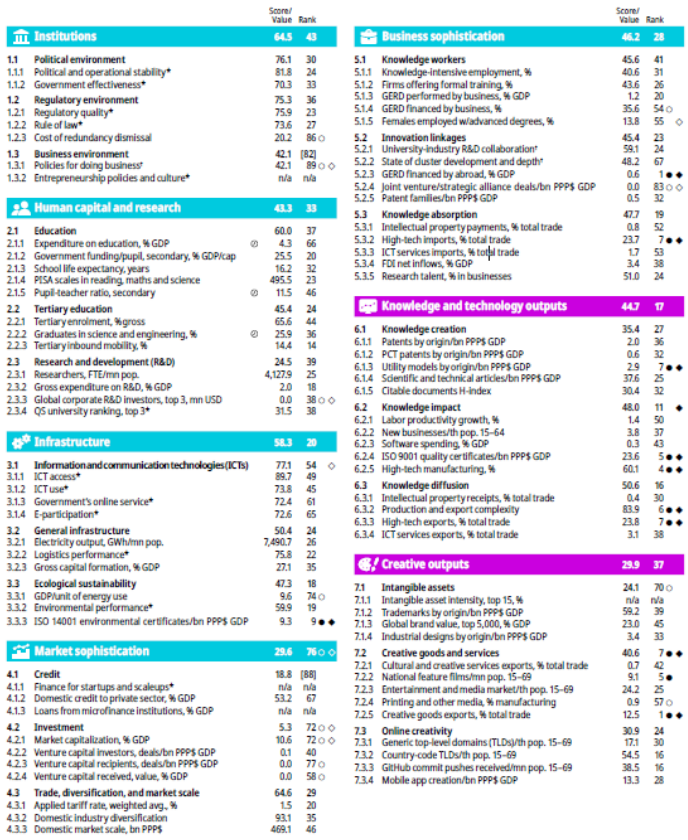
It is evident that the Czech economy is characterized by a high share of branches of foreign firms. Among independent - Czech - firms, local firms predominate and only to a limited extent firms with a regional and rarely global character.

The transformation of the Czech economy in the post-1989 period was thus largely successful, as it was soon able to convince foreign investors of its stability, security and attractiveness. Thanks to this, for example, the Czech Republic has long been one of the countries with record low unemployment. However, at the present stage it is clear that for the further development of the Czech economy as an innovation economy, it is necessary to focus much more on the endogenous growth factors of Czech firms and at the same time to use the potential brought by investments of foreign firms.

A useful comparison here is the Global Innovation Index (GII) compiled regularly by WIPO.

Source: WIPO, Global Innovation Index, 2022; www.wipo.org

Source: Technology Agency of the Czech Republic, Evaluation of innovation capacity in firms in the Czech Republic, Consolidated report on collection, processing and analysis of primary data, INKA - mapping of innovation capacity https://inkaviz.tacr.cz/data/INKA-2--Hodnocen%C3%AD-sb%C4%9Bru-prim%C3%A1rn%C3%ADch-dat-ve-firm%C3%A1ch.pdf



		Score/ Value	Rank
Institutions		**64.5**	**43**
1.1	**Political environment**	76.1	30
1.1.1	Political and operational stability*	81.8	24
1.1.2	Government effectiveness*	70.3	33
1.2	**Regulatory environment**	75.3	36
1.2.1	Regulatory quality*	75.9	23
1.2.2	Rule of law*	73.6	27
1.2.3	Cost of redundancy dismissal	20.2	86 ○
1.3	**Business environment**	42.1	[82]
1.3.1	Policies for doing business*	42.1	89 ○ ◇
1.3.2	Entrepreneurship policies and culture*	n/a	n/a
Human capital and research		**43.3**	**33**
2.1	**Education**	60.0	37
2.1.1	Expenditure on education, % GDP ⊘	4.3	66
2.1.2	Government funding/pupil, secondary, % GDP/cap	25.5	20
2.1.3	School life expectancy, years	16.2	32
2.1.4	PISA scales in reading, maths and science	495.5	23
2.1.5	Pupil-teacher ratio, secondary ⊘	11.5	46
2.2	**Tertiary education**	45.4	24
2.2.1	Tertiary enrolment, % gross	65.6	44
2.2.2	Graduates in science and engineering, % ⊘	25.9	36
2.2.3	Tertiary inbound mobility, %	14.4	14
2.3	**Research and development (R&D)**	24.5	39
2.3.1	Researchers, FTE/mn pop.	4,127.9	25
2.3.2	Gross expenditure on R&D, % GDP	2.0	18
2.3.3	Global corporate R&D investors, top 3, mn USD	0.0	38 ○ ◇
2.3.4	QS university ranking, top 3*	31.5	38
Infrastructure		**58.3**	**20**
3.1	**Information and communication technologies (ICTs)**	77.1	54 ◇
3.1.1	ICT access*	89.7	49
3.1.2	ICT use*	73.8	45
3.1.3	Government's online service*	72.4	61
3.1.4	E-participation*	72.6	65
3.2	**General infrastructure**	50.4	24
3.2.1	Electricity output, GWh/mn pop.	7,490.7	26
3.2.2	Logistics performance*	75.8	22
3.2.3	Gross capital formation, % GDP	27.1	35
3.3	**Ecological sustainability**	47.3	18
3.3.1	GDP/unit of energy use	9.6	74 ○
3.3.2	Environmental performance*	59.9	19
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	9.3	9 ● ◆
Market sophistication		**29.6**	**76** ○ ◇
4.1	**Credit**	18.8	[88]
4.1.1	Finance for startups and scaleups*	n/a	n/a
4.1.2	Domestic credit to private sector, % GDP	53.2	67
4.1.3	Loans from microfinance institutions, % GDP	n/a	n/a
4.2	**Investment**	5.3	72 ○ ◇
4.2.1	Market capitalization, % GDP	10.6	72 ○ ◇
4.2.2	Venture capital investors, deals/bn PPP$ GDP	0.1	40
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	0.0	77 ○
4.2.4	Venture capital received, value, % GDP	0.0	58 ○
4.3	**Trade, diversification, and market scale**	64.6	29
4.3.1	Applied tariff rate, weighted avg., %	1.5	20
4.3.2	Domestic industry diversification	93.1	35
4.3.3	Domestic market scale, bn PPP$	469.1	46

		Score/ Value	Rank
Business sophistication		**46.2**	**28**
5.1	**Knowledge workers**	45.6	41
5.1.1	Knowledge-intensive employment, %	40.6	31
5.1.2	Firms offering formal training, %	43.6	26
5.1.3	GERD performed by business, % GDP	1.2	20
5.1.4	GERD financed by business, %	35.6	54 ○
5.1.5	Females employed w/advanced degrees, %	13.8	55 ◇
5.2	**Innovation linkages**	45.4	23
5.2.1	University-industry R&D collaboration*	59.1	24
5.2.2	State of cluster development and depth*	48.2	67
5.2.3	GERD financed by abroad, % GDP	0.6	1 ● ◆
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	83 ○ ◇
5.2.5	Patent families/bn PPP$ GDP	0.5	32
5.3	**Knowledge absorption**	47.7	19
5.3.1	Intellectual property payments, % total trade	0.8	52
5.3.2	High-tech imports, % total trade	23.7	7 ● ◆
5.3.3	ICT services imports, % total trade	1.7	53
5.3.4	FDI net inflows, % GDP	3.4	38
5.3.5	Research talent, % in businesses	51.0	24
Knowledge and technology outputs		**44.7**	**17**
6.1	**Knowledge creation**	35.4	27
6.1.1	Patents by origin/bn PPP$ GDP	2.0	36
6.1.2	PCT patents by origin/bn PPP$ GDP	0.6	32
6.1.3	Utility models by origin/bn PPP$ GDP	2.9	7 ● ◆
6.1.4	Scientific and technical articles/bn PPP$ GDP	37.6	25
6.1.5	Citable documents H-index	30.4	32
6.2	**Knowledge impact**	48.0	11 ◆
6.2.1	Labor productivity growth, %	1.4	50
6.2.2	New businesses/th pop. 15–64	3.8	37
6.2.3	Software spending, % GDP	0.3	43
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	23.6	5 ● ◆
6.2.5	High-tech manufacturing, %	60.1	4 ● ◆
6.3	**Knowledge diffusion**	50.6	16
6.3.1	Intellectual property receipts, % total trade	0.4	30
6.3.2	Production and export complexity	83.9	6 ● ◆
6.3.3	High-tech exports, % total trade	23.8	7 ● ◆
6.3.4	ICT services exports, % total trade	3.1	38
Creative outputs		**29.9**	**37**
7.1	**Intangible assets**	24.1	70 ○
7.1.1	Intangible asset intensity, top 15, %	n/a	n/a
7.1.2	Trademarks by origin/bn PPP$ GDP	59.2	39
7.1.3	Global brand value, top 5,000, % GDP	23.0	45
7.1.4	Industrial designs by origin/bn PPP$ GDP	3.4	33
7.2	**Creative goods and services**	40.6	7 ● ◆
7.2.1	Cultural and creative services exports, % total trade	0.7	42
7.2.2	National feature films/mn pop. 15–69	9.1	5 ●
7.2.3	Entertainment and media market/th pop. 15–69	24.2	25
7.2.4	Printing and other media, % manufacturing	0.9	57 ○
7.2.5	Creative goods exports, % total trade	12.5	1 ● ◆
7.3	**Online creativity**	30.9	24
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	17.1	30
7.3.2	Country-code TLDs/th pop. 15–69	54.5	16
7.3.3	GitHub commit pushes received/mn pop. 15–69	38.5	16
7.3.4	Mobile app creation/bn PPP$ GDP	13.3	28

The Czech Republic is ranked 30th overall in the GII, but we see that in some categories it is a top performer, while in others it lags significantly behind. Particularly noteworthy is parameter 5.2.3, i.e. foreign-funded R&D expenditure, where it is ranked first worldwide. This shows, among other things, that the Czech Republic is a country where it is attractive for foreign investors to conduct R&D. However, the question is to what extent the benefits of this research are then realized in the Czech Republic.

However, in some parameters the Czech Republic lags far behind. For example, in the areas related to venture capital (VC) investments, the Czech economy often ranks in the second half of the countries assessed, especially in parameter 4.2.3 related to venture capital recipients in the Czech Republic and 5.2.4 related to strategic alliances and VC investments. This shows that Czech firms are not sufficiently considered for investment by equity investors and that the Czech VC market has the potential for growth and greater linkages with global capital.

One of the solutions is to increase the attractiveness of the Czech Republic for capital investors in innovative companies. This can be done by way of legislative changes (for example, the possibility of introducing employee stock option programmes, the so-called ESOP, is one option) and by supporting investment in innovative companies in the early (and therefore risky) stages of their existence. Here, one of the appropriate ways would be, for example, to expand the Czech Republic's cooperation with the European Investment Fund, which has long specialized in this type of investment and could help to make the market for seed investments more dynamic in cooperation with Czech investment managers. Thanks to this, the Czech economy could advance in one of the most critically assessed parameters according to the GII.

Cooperation with the European Investment Fund on such funds is now being implemented by the Ministry of Industry and Trade in cooperation with representatives of the capital investment market and it is thus likely that improvements in these relevant GII parameters could occur in the coming years. Similarly, a legislative solution to the ESOP issue is being prepared to increase the motivation

of employees to participate in the development of innovative start-ups and thus to support Czech companies with regional or global ambitions.

10 Literature cited

Abarbanell, J. S., Bushee, B. J., & Smith Raedy, J. (duben 2003). Institutional Investor Preferences and Price Pressure: The Case of Corporate Spin-Offs. *The Journal of Business*, stránky 233-267. Načteno z https://www.jstor.org/stable/10.1086/367749

Agency, A. C. (2023). *Traffic Light Protocol (TLP) Definitions and Usage.* Načteno z https://www.cisa.gov/news-events/news/traffic-light-protocol-tlp-definitions-and-usage

"Autorský zákon" (2022), Wikipedia, cs.

Bělecký, Jiří (2014). "Software piracy", Univerzita Karlova, Právnická fakulta

Björkqvist, Sebastian & Kallio, Juho (2023). "Building a Graph-Based Patent Search Engine", Proceedings of the 46th International ACM SIGIR Conference on Research and Development in Information Retrieval.

Bjornali, E. S., & Aspelund, A. (2012). The role of the entrepreneurial team and the board of directors in the internationalization of academic spin-offs. *Journal of International Entrepreneurship*, stránky 350-377. Načteno z https://link.springer.com/article/10.1007/s10843-012-0094-5

Blair, D. M., & Hitchens, D. M. (2018). *Campus Companies - UK and Ireland.* Routlege.

Borbye, Lisbeth, Stocum, Michael, Woodall, Alan, Pearce, Cedric et al. (2009). "Industry Immersion Learning", Wiley.

Bulanova, Oxana, Madsen, Einar Lier. "ERAWATCH Country Reports 2012 : Norway", Publications Office of the European Union

Burri, Mira (2006). "Regulatory Objectives for Contemporary Electronic Communications : Talking Business or Talking Culture?", NCCR Trade Regulation.

COCKBAIN, J. (2007). "Intellectual Property Rights and Patents", Volume 1 Global Perspective.

Creative Commons. (nedatováno). Získáno 2023, z https://creativecommons.org/licenses/?lang=cs

Čejková, Darina, Zobaníková, Marie (2014). "Genové patenty", Masarykova univerzita.

Červenka, Jiří (2022). "Copyright law and its protection in music industry", Západočeská univerzita v Plzni

Česká technická norma ČSM ISO/IEC 27002 . (nedatováno).

De Cleyn, S. H., & Braet, J. (June 2007). Research valorisation through spin-off ventures: Integration of existing concepts and typologies. *World Review of Entrepreneurship, Management and Sustainable Development*.

Delmelle, E., Hagenlocher, M., Kienberger, S., & Casas, I. (prosinec 2016). A spatial model of socioeconomic and environmental determinants of dengue fever in Cali, Columbia. *Acta Tropica*, str. http://www.sciencedirect.com/science/article/pii/S0001706X16306738. Načteno z http://www.sciencedirect.com/science/article/pii/S0001706X16306738

Doleček, M. (2022). *Obchodní tajemství*. Načteno z https://www.businessinfo.cz/navody/obchodni-tajemstvi-ppbi/

Elert, Nicole, Brooks, Christopher T. (2013)."German Employment Law", Walter de Gruyter GmbH.

Furgal, Ula (2020). "Reversion rights in the European Union Member States", UK Copyright and Creative Economy Centre.

Gompers, P., & Lerner, J. (2001). The Venture Capital Revolution. *The Journal of Economic Perspectives*, stránky 145-168.

Güttlerová, Alice (2020). "Copyright protection of architectural work, current development trends", Univerzita Karlova, Právnická fakulta.

Handbook on industrial property information and documentation. (30. May 1997). (WIPO) Získáno 2023, z https://www.wipo.int/export/sites/www/standards/en/pdf/03-16-01.pdf

Hayter, C. (February 2013). Harnessing University Entrepreneurship for Economic Growth Factors of Success Among University Spin-offs. *Economic Development Quarterly* , stránky 18-28.

Hudečková, Zuzana (2014). "Protection of Intellectual Property in the Company", Vysoká škola báňská - Technická univerzita Ostrava.

Chase, M. (2016). *People of our everyday life*. Získáno 12. prosinec 2017, z http://peopleof.oureverydaylife.com/definition-socioeconomic-factors-8373.html

Chloupek, V. (2021). Vymáhání práv z duševního vlastnictví v rámci vzdělávacího cyklu "Nebojte se transferu". Praha: Centrum transferu technologií AV ČR.

Christie, Andrew (2023). "Blackstone's Statutes on Intellectual Property", Blackstone's Statutes on Intellectual Property.

Kačírek, M. (26. červenec 2018). *Řízení před úřadem*. (Informační portál o patentovém právu) Načteno z https://vynalez-patent.cz/rizeni-pred-uradem/

Kebapci, H., Von Wendland, B., & Kaymaktchyyski, S. (05. 11 2020). Publications Office of the European Union. doi:10.2760/675525

KIND Codes. (nedatováno). (European patent office) Získáno 2023, z https://cz.espacenet.com/help?topic=kindcodes&locale=cz_CZ&method=handleHelpTopic

Kliman, M. (18. duben 2020). *https://vedavyzkum.cz/transfer-znalosti-a-spoluprace/transfer-znalosti-a-spoluprace/typy-spin-off-spolecnosti-zakladanych-akademickym-sektorem.* Načteno z Vedavyzkum.cz: https://vedavyzkum.cz/transfer-znalosti-a-spoluprace/transfer-znalosti-a-spoluprace/typy-spin-off-spolecnosti-zakladanych-akademickym-sektorem

Kolářová, Magdalena (2017). "Assessment of Research and Development Projects in Terms of Income Tax Act", Vysoké učení technické v Brně. Fakulta podnikatelská.

Kolektiv. (nedatováno). *Technická řešení a jejich právní ochrana*. (Úřad průmyslového vlastnictví) Získáno 2023, z https://upv.gov.cz/files/uploads/PDF_Dokumenty/brozury/2022/Brozura_TR_2022.pdf

Konečný, Martin (2019). "GAP analysis of information security management system", Vysoké učení technické v Brně. Fakulta podnikatelská.

Košík, P. (2014). *Licenční smlouvy v oblasti duševního vlastnictví*. (ePrávo.cz) Získáno 2023, z https://www.epravo.cz/top/clanky/licencni-smlouvy-v-oblasti-dusevniho-vlastnictvi-soucasny-stav-podle-noveho-obcanskeho-zakoniku-95227.html

Kratochvíl, J. (červenec 2022). *Instrukce předsedy Úřadu průmyslového vlastnictví*. (Úřad průmyslového vlastnictví) Získáno 2023, z https://upv.gov.cz/files/uploads/PDF_Dokumenty/brozury/2022/brozura_instrukce_predsedy_2022.pdf

Larsen, Ingvild Marheim, Hofsøy, Mai-Lin, Yuan, Zheng Ørvim & Aasen, Petter (2019). "Performance agreements for clearer institutional profiles and better division of labour", Tertiary Education and Management.

"Legal and regulatory update" (08/2007), Journal of Commercial Biotechnology.

Machů, Matěj, Pecková, Adéla, Adlerová, Eva (2017). "Úvod do systému právní ochrany duševního vlastnictví ve Státě Izrael", Revue pro právo a technologie.

Meld, S. 1. (2018-2019). *The health industry: working together on value creation and better services*. (Ministry of Trade, Industry and Fisheries) Získáno 2023, z https://www.regjeringen.no/contentassets/41435798a618491e902935a590967502/en-gb/pdfs/stm201820190018000engpdfs.pdf

Metodika TRIZ - tvorba a řešení inovačních až invenčních zadání. (2023). Získáno 2023, z http://triz.cz/

Ministry of Trade, Industry and Fisheries Norway. (2013). *Meld. St. 28 (2012-2013) Unique ideas, major assets*. (Ministry of Trade and Industry (NO)) Získáno 2023, z https://www.regjeringen.no/en/dokumenter/meld.-st.-28-2012-2013/id722822/?ch=1

MŠMT ČR. (17. květen 2022). Metodika vykazování hospodářských činností z hlediska veřejné podpory. Načteno z https://opjak.cz/wp-content/uploads/2022/05/Metodika_vykazovani_HC_OP_JAK.pdf

National Centre for Education Statistics. (2013). Načteno z https://nces.ed.gov/nationsreportcard/pdf/researchcenter/Socioeconomic_Factors.pdf

"New Trends in Finance and Accounting" (2017), Springer Science and Business Media LLC.

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Creatie the Dynamics of Innovation.* New York: Oxford University Press.

Novotná, Zuzana (2018). "Sources of Funding for Research and Development and their Utilization in VZLÚ, Inc."

OECD. (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities,*. (OECD Publishing, Paris) Získáno 2023, z https://doi.org/10.1787/9789264239012

Ondrejová Dana, Sehnálek David (2016). "Vliv práva Evropské unie na českou regulaci nekalé soutěže a nekalých obchodních praktik", Masarykova univerzita.

Osawa, Y., & Miyazaki, K. (2006). An empirical analysis of the valley of death: Large-scale R&D project performance in a Japanese diversified company. *Asian Journal of Technology Innovation*, stránky 93-116.

"Reforms, Organizational Change and Performance in Higher Education" (2019), Springer Science and Business Media LLC.

"Rechtliche Aspekte der Genom-Editierung an der menschlichen Keimbahn" (2020), Springer Science and Business Media LLC.

Request for grant of a European patent. (2022). Načteno z https://documents.epo.org/projects/babylon/eponet.nsf/0/5C683C367A8DFBC7C12577F400449FD8/$File/eeo_1001_03_23_editable.pdf

Rowley, J., Baregheh, A., & Sambrook, S. (February 2011). Towards an innovation-type mapping tool. *Management Decision*, stránky 73-86. doi:10.1108/00251741111094446

RVVI, p. s. (listopad 2020). Identifikace hospodářských a nehospodářských činností výzkumných organizací a výzkumných infrastruktur ve výzkumu, vývoji a inovacích. *Identifikace hospodářských a nehospodářských činností výzkumných organizací a výzkumných infrastruktur ve výzkumu, vývoji a inovacích*. vláda ČR. Načteno z https://www.spcr.cz/images/Identifikace_hospodarskych_a_nehospodarskych_cinnosti_VO_a_vyzkumnych_infrastruktur_ve_VaVaI-2.pdf

Ryantová, Olga (2013). "Check Exercise - Construction of Flood Dikes", Vysoká škola báňská - Technická univerzita Ostrava.

Sdělení Komise - Rámec pro státní podporu výzkumu, vývoje a inovací (2022/C 414/01). (28. 10 2022). Evropská komise. Získáno 2023, z https://eur-lex.europa.eu/legal-content/CS/TXT/?uri=CELEX%3A52022XC1028%2803%29&qid=1686492946131

Schillo, S. R. (18. June 2016). Research-based spin-offs as agents in the entrepreneurial ecosystem. *The Journal of Technology Transfer*, stránky 222-239. Načteno z https://link.springer.com/article/10.1007/s10961-016-9484-5

Scholzová, L., & Beluský, M. (nedatováno). Cyklus "Transferářem snadno a rychle", část 6. spolupráce ve výzkumu.

Scholzová, L., & Hruška, J. (2022). Cyklus "Transferářem snadno a rychle", část 3. práva k výsledkům. Praha: Centrum transferu technologií AV ČR.

Scholzová, L., Beluský, M., & Smekal, M. (únor 2022). AVEX: Expertní stanovisko AV ČR: Transfer znalostí a technologií. Akademie věd ČR. Načteno z https://www.avcr.cz/export/sites/avcr.cz/cs/veda-a-vyzkum/avex/files/2022-02.pdf

Skaug, Hilde Nancy & Osnes, Heid (2019). "Lærerikt å forske selv om jeg"bare" er student! Studentaktiv forskning på barnehagelærerutdanningen", Högre utbildning.

Svobodová, Kateřina (2016). "Business plan as a tool for obtaining subsidy", Západočeská univerzita v Plzni.

Štemberková, R. (2019). *Management vědy a výzkumu - efektivita řízení ochrany duševního vlastnictví na univerzitě (disertační práce)*. Hradec Králové: Univerzita Hradec Králové, Fakulta informatiky a managementu.

Šťastný, Filip (2010). "Criminal activity on foreign tourists in Prague I", Technická Univerzita v Liberci.

Švábová, Jana (2015). "Contract of sale under business law", Univerzita Karlova, Právnická fakulta.

Technologická agentura ČR, Hodnocení inovačních kapacit ve firmách v Česku, Konsolidovaná zpráva ze sběru, zpracování a analýzy primárních dat, INKA – mapování inovační kapacity https://inkaviz.tacr.cz/data/INKA-2--Hodnocen%C3%AD-sb%C4%9Bru-prim%C3%A1rn%C3%ADch-dat-ve-firm%C3%A1ch.pdf

University of Oslo. (2011). Policy for intellectual property right at he University of Oslo.

Úřad průmyslového vlastnictví - přihláška vynálezu. (2022). (Úřad průmyslového vlastnictví) Získáno 2023, z https://upv.gov.cz/files/uploads/PDF_Dokumenty/Forms2022V/P01_PV_vynalez_V_O.pdf

Veselý, Marek (2016). "Implementation of Information Security in the Enterprise", Vysoké učenítechnické v Brně. Fakulta podnikatelská.

Vondras, J. (28. leden 2021). *Patentová čistota technologií a výrobků*. (Plasseraud IP) Získáno 2023, z https://www.plass.com/cz/articles/patentova-cistota-technologii-vyrobku

Weckström, Katja & Tammenlehto, Laura (2023). "Chapter 3-1 The Concept of Originality in Finland", Springer Science and Business Media LLC.

WIPO. (1967). *Úmluva o zřízení Světové organizace duševního vlastnictví*. (Úřad průmyslového vlastnictví) Získáno 2023, z https://www.upv.cz/cs/pravni-predpisy/mezinarodni.html

WIPO, Global Innovation Index, 2022; www.wipo.org

Zákon č. 121/2000 Sb., zákon o právu autorském, o právech souvisejících s právem autorským a o změně některých zákonů. (nedatováno).

Zákon č. 130/2002 Sb. o podpoře výzkumu a vývoje z veřejných prostředků. (2002).

Zákon č. 151/1997 Sb. o oceňování majetku. (1997). *Zákon č. 151/1997 Sb. o oceňování majetku*. Načteno z https://www.zakonyprolidi.cz/cs/1997-151

Zákon č. 181/2014 Sb. o kybernetické bezpečnosti. (nedatováno).

Zákon č. 207/2000 Sb. o ochraně průmyslových vzorů. (nedatováno).

Zákon č. 441/2003 Sb., o ochranných známkách . (nedatováno).

Zákon č. 452/2001 Sb., o ochraně označení původu a zeměpisných označení. (nedatováno).

Zákon č. 478/1992 Sb. o užitných vzorech. (nedatováno).

Zákon č. 527/1990 Sb. o vynálezech, průmyslových vzorech a zlepšovacích návrzích. (nedatováno). *Patentový zákon*.

Zákon č. 529/1991 Sb., o ochraně topografií polovodičových výrobků. (nedatováno).

Zákon č. 89/2012 Sb. Občanský zákoník. (nedatováno).

Zákon č. 93/2018 Sb. o podmínkách využívání genetických zdrojů podle Nagojského protokolu. (nedatováno).

Zákon č. č. 412/2005 Sb o ochraně utajovaných informací a o bezpečnostní způsobilosti. (nedatováno).

Zemanová, Kristýna (2013). "Significance of the old law trademark rights", Univerzita Karlova, Právnická fakulta.

Links to websites:

https://www.jcu.cz/images/veda-a-vyzkum/hr-award/strategie-pro-rozvoj-mezisektorovespoluprace-nakladani-s-dusev_p62785.pdf

https://eur-lex.europa.eu/legal-content/CS/TXT/HTML/?uri=OJ%3AC%3A2022%3A414%3AFULL

https://ott.mendelu.cz/wcd/w-rek-ctt/formulare/od-vy-zkumu-po-vyuz-i-va-ni-v-praxi-pdf.pdf

https://is.muni.cz/el/phil/jaro2019/MVKK_09/um/autorsky_zakon-2019.txt

https://www.uio.no/english/about/regulations/research/intellectual-property/index.html#toc2

https://www.jcu.cz/images/UNIVERZITA/Dokumenty/opatreni-rektora/platnaopatreni/2022/r_494_pravidla-pro-zakladani-spinn-off-spolecnosti-na-ju.pdf

https://theses.cz/id/f58vmh/STAG85153.pdf?lang=en

https://rtt.mendelu.cz/wcd/w-rek-projekty/ctt/aula-transfera-1_2_2021.pdf

https://publi.cz/download/publication/738?online=1

https://www.tacr.cz/dokums_raw/novinky/170404_FRASCATI%20pdf_final_ke%20koment%C3%A1%C5%99%C5%AFm.pdf

https://public.psp.cz/sqw/text/orig2.sqw?idd=135113

https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=NIM%3A267525

https://eur-lex.europa.eu/legal-content/CS/TXT/HTML/?uri=CELEX%3A52014XC0627%2801%29

https://is.muni.cz/do/rect/metodika/VaV/vyzkum/44250404/3054650/49764836/57167109/57055713/ZD_VES_2016.txt

https://is.muni.cz/el/1421/podzim2016/PV1A104/um/M._Janku-Zaklady-prava-proposluchace-nepravnickych-fakult-5.vyd.-_1_.txt

https://www.uio.no/english/research/strategic-research-areas/life-science/about/whatis/#:~:text=Researchers%20in%20life%20sciences%20study,diagnosing%2C%20preve

https://www.uio.no/english/research/strategic-research-areas/uio-energy/index.html

https://theses.cz/id/ch5snr/00154410-282147336.txt

https://rtt.mendelu.cz/wcd/w-rek-projekty/ctt/metodiky/metodika_2.pdf

https://vyzkum.cz/FrontClanek.aspx?ad=1&attid=851722&idsekce=822291 (from 01-Oct-2022)

https://vyzkum.cz/FrontClanek.aspx?ad=1&attid=948064&idsekce=947900 (from 22-Nov-2021)

https://www.tacr.cz/wpcontent/uploads/documents/2021/05/11/1620725771_Obecn%C3%A1%20p%C5%99%C3%ADru%C4%8Dka%20pro%20hodnotitele%20(1).pdf

https://docplayer.cz/27080788-Problematika-transferu-technologii-ve-vyuce-a-praxipatentovani-proces-a-ekonomika-z-pohledu-puvodce-objevu.html

https://docplayer.cz/28595610-Smejkalovo-repetitorium-dusevniho-vlastnictvi.html

https://docplayer.cz/2210026-Clanek-1-predmet-upravy.html

https://docplayer.cz/109789039-Autorske-pravo-nejen-v-kartografii.html

https://docplayer.cz/6672213-Prumyslove-vlastnictvi-univerzita-palackeho-v-olomoucidusevni-vlastnictvi-prumyslovy-vzor-prumyslovy-vzor-prumyslovy-vzor.html

http://docplayer.cz/23211-L-134-2-cs-uredni-vestnik-evropske-unie-29-5-2009.html

https://docplayer.cz/4434709-Dusevni-vlastnictvi-v-oblasti-mezinarodnich-projektu-vedy-avyzkumu.html

https://docplayer.cz/186039-Ochrana-prav-dusevniho-vlastnictvi-ing-tomas-badal.html

https://dspace.cuni.cz/bitstream/handle/20.500.11956/122546/140077769.pdf?isAllowed=y&sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/152427/120402937.pdf?isAllowed=y&sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/110684/120347302.pdf?sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/170713/120407081.pdf?sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/116480/120352265.pdf?isAllowed=y&sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/59253/150017616.pdf?isAllowed=y&sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/25096/DPTX_2009_2_11220_0_31047_0_85108.pdf?isAllowed=y&sequence=1

https://dspace.cuni.cz/bitstream/handle/20.500.11956/42742/DPTX_2010_1_11220_0_38691_0_99744.pdf?isAllowed=y&sequence=1

http://www.businessinfo.cz/cs/clanky/obchodni-tajemstvi-opu-preview-43802.html (from 16-Apr-2014)

http://www.businessinfo.cz/cs/zahranicni-obchod-eu/pravni-prostredi-a-regulace/obchod-svojenskym-materialem.html (from 30-Apr-2016)

https://www.businessinfo.cz/navody/ochranne-znamky-jak-zaregistrovat-ochrannou-znamkuppbi/2 (from 7-Apr-2023)

https://www.businessinfo.cz/clanky/co-prinesla-novela-zakona-o-ochrannych-znamkach/ (from 12-March-2023)

https://www.businessinfo.cz/clanky/patent-predstavuje-majetek/ (from 18-Feb-2023)

https://dspace.jcu.cz/bitstream/handle/123456789/39181/Jan_Bartos_Diplomova_prace_-

_Vybrane_socioekonomicke_prinosy_minipivovaru.pdf?isAllowed=y&sequence=1

https://dspace.jcu.cz/bitstream/handle/123456789/20702/DP_Frantisek_Remias_CNPKS.pdf?

isAllowed=y&sequence=1

https://smlouvy.gov.cz/smlouva/soubor/7043440/Priloha1SML9100001217.pdf

http://greplak.cz/doc/Jan%20Grepl%20-

%20Pr%C3%A1vo%20du%C5%A1evn%C3%ADho%20vlastnictv%C3%AD.pdf

https://www.Sintef.no/en/tto/holdings/

https://pdffox.com/ramec-pro-statni-podporu-vyzkumu-vyvoje-a-inovaci-pdf-free.html

https://www.regjeringen.no/contentassets/d1b6af2f59b149f9bcaf94924607f5f9/engb/epub/stm201220130028000engepub.epub

https://www.regjeringen.no/en/dokumenter/meld.-st.-7-2014-2015/id2005541/?ch=1&q=livsvitenskap

http://www.regjeringen.no/en/doc/propositions-and-reports-/white-papers-.html?id=1754

https://www.regjeringen.no/en/dep/ud/organisation/departments/press_office/head-ofcommunications-trude-maseide/id735729/

https://www.regjeringen.no/en/dep/nfd/organisation/minister-of-trade-and-industry-monicama/speeches-and-articles-by-monica-maland/id745854/?page=93

https://www.nord.no/en/research/innovation/technology-transfer-office

https://norinnova.no/en/startup/selskaper/

https://ejje.weblio.jp/sentence/content/%E3%81%9D%E3%81%AE%E5%85%88/411

https://ejje.weblio.jp/sentence/content/%E4%BD%BF%E7%94%A8%E3%81%AE%E7%9B%AE%E7%9A%84/194

https://ejje.weblio.jp/sentence/content/%E5%90%8C%E6%84%8F%E3%81%97%E3%81%9F/44

https://ejje.weblio.jp/sentence/content/%E3%81%B2%E3%81%A8%E3%81%A7%E3%81%93%E3%81%86/849

https://insis.vse.cz/zp/34285/priloha/12267

https://insis.vse.cz/zp/49057

https://insis.vse.cz/zp/63221

https://www.forskningsradet.no/en/apply-for-funding/who-can-apply-for-funding/researchorganisations/approved-research-organisations/

https://nywww.patentstyret.no/en/services/patents/Rules-and-regulations-patents/employeesinventions-act/

https://vdoc.pub/documents/oecd-reviews-of-innovation-policy-norway-2017-volume-2017-

1us9ugu9cigo

https://vdoc.pub/documents/media-entertainment-law-1on09jeuli20

https://www.kjellerinnovasjon.no/projects/

https://digilib.k.utb.cz/bitstream/handle/10563/19386/videczk%c3%bd_2012_dp.pdf?isAllowed=y&sequence=1

https://opus4.kobv.de/opus4-

hsog/frontdoor/deliver/index/docId/4074/file/Dissertation_Traut.pdf

https://dspace5.zcu.cz/bitstream/11025/48396/1/Finalni%20verze%20Diplomove%20prace.pdf

https://dspace5.zcu.cz/bitstream/11025/7988/1/Cejkova_DP_portal.pdf

https://dspace5.zcu.cz/bitstream/11025/12838/1/DPHosnedlova.pdf

https://dspace5.zcu.cz/bitstream/11025/41389/1/Pracovnepravni%20aspekty%20dusevniho%20a%20prumysloveho%20vlastnictvi%2cDiplomova%20prace%2c%20Jan%20Sourek.pdf

https://repozitorij.unizg.hr/islandora/object/pravo%3A5296/datastream/PDF/view

https://is.mvso.cz/el/mvso/leto2022/XSKP2/um/Soukrome_pravo_2_-_studijni_text.pdf

https://stratin.tc.cas.cz/vystupy/2022/M1/SEIA-VVI_koncept.pdf

http://www.ecovislegal.cz/aktuality/nejdulezitejsi-zmeny-pro-podnikatele-pravni-novinky-2019/

https://www.zakonyprolidi.cz/media2/file/1705/File9152.pdf?attachment-filename=6019620-

2017-03-17-text-navrhu-6041055.pdf

https://www.zakonyprolidi.cz/media2/file/1705/File6960.pdf?attachment-filename=5817511-

2016-05-11-text-navrhu-6033662.pdf

https://www.mvcr.cz/sluzba/soubor/skripta-56-opv-autorskych-prav-a-prav-souvisejicich20230630-pdf.aspx

https://waseda.repo.nii.ac.jp/?action=repository_action_common_download&attribute_id=20&file_no=1&item_id=57988&item_no=1

https://hodnoceni.rvvi.cz/public/OBORY%20Vybrane%20vysledky%20-%20komentare%20Odbornych%20panelu/OP2%20M1%20koment%C3%A1%C5%99.docx

http://www.healthreform.cz/content/files/cz/Reforma/2_Clanky_prezentace/Prezentace/PH_euroforum_27_9_05.pdf

http://www.holec-advokati.cz/cs/publikace/aktuality/376

https://dspace.tul.cz/bitstream/handle/15240/165915/BP_Ljuba_Kanciova.pdf?

isAllowed=y&sequence=1

http://www.jiribrda.cz/jak-je-to-vlastne-s-autorskymi-pravy-u-grafiky.html

https://www.msmt.cz/file/58758_1_1/download/

https://www.msmt.cz/file/44086_1_1/download/

https://acuresearchbank.acu.edu.au/download/80346347b0b0f53abd552c4afe5a744d9061c8519dfa0b2f6ceb5dc9866078d8/8149813/LIPTON_2018_EMBARGO_More_than_open_data_mandates.pdf

https://mastersofmedia.hum.uva.nl/blog/2021/10/29/yourtube-a-project-to-detect-the-biaswithin-the-youtube-algorithm/

https://www.kaniasedlaksmola.cz/sluzby/ochranne-znamky

https://www.upv.cz/dms/pdf_dokumenty/prakticka_pomucka_rizeniupv/2019/mp_F_ochranne-znamky_2019.pdf

http://www.dusevnivlastnictvi.cz/images/dokumenty/Metodika04.pdf

http://www.financnianalytickyurad.cz/download/FileUploadComponent96186445/1481722453_cs_4-narizeni_narizeni-rady-20151861.pdf

https://adoc.pub/1993-sb-listina-zakladnich-prav-a-svobod-vybrana-ustanoveni.html

http://rgcr.cz/wp-content/uploads/2017/05/Museum-um%C4%9Bn%C3%AD-aspole%C4%8Dnost-2007-1.pdf

https://www.bezplatnapravniporadna.cz/ruzne/pestounstvi-osvojeni-adopce-informace/135-

web.html

https://www.bezplatnapravniporadna.cz/online-zdarma/component/zmtalk/questions.html? theme_id=0

https://www.ucetniportal.cz/wiki/search?

criteria%5B0%5D%5Btitle%5D=250%2F2000+Sb.+Z%C3%A1kon+o+rozpo%C4%8Dtov%C3%BDch+pravidlech+%C3%BAzemn%C3%ADch+rozpo%C4%8Dt%C5%AF&criteria%5B0%5D%5Btype%5D=tag&criteria%5B0%5D%5Bvalue%5D=3149&groupItem=kbItem_224909&item=kbItem_516729&originalItem=kbItem_214877¶ms=wiki%2FgroupSearch&score=1030.3913574219&searchResults=wiki%2FgroupSearch%3Fcriteria%255B0%255D%255Btitle%255D%3D250%252F2000%2BSb.%2BZ%25C3%25A1kon%2Bo%2Brozpo%25C4%258Dtov%25C3%25BDch%2Bpravidlech%2B%25C3%25BAzemn%25C3%25ADch%2Brozpo%25C4%258Dt%25C5%25AF%26criteria%255B0%255D%255Btype%255D%3Dtag%26criteria%255B0%255D%255Bvalue%255D%3D3149%26groupItem%3DkbItem_224909%26item%3DkbItem_224909%26originalItem%3DkbItem_214877%26score%3D2041.6424560547%26service%3D&service=

https://dspace.vutbr.cz/bitstream/handle/11012/65590/xpalic00Systemoveresenibezpecnostiinformacivorgranizaci.pdf?isAllowed=y&sequence=-1

https://dspace.vutbr.cz/xmlui/bitstream/handle/11012/81292/DP_Smerickova_Michaela_163588.pdf?isAllowed=y&sequence=1

https://openarchive.usn.no/usnxmlui/bitstream/handle/11250/3026909/2022_141_Bergman_web.pdf?isAllowed=y&sequence=3

https://profesis.ckait.cz/dokumenty-ckait/a-3-18/

https://ebooks.uni-lj.si/zalozbaul/catalog/download/133/232/3631-1?inline=1

https://pure.jgu.edu.in/id/eprint/2104/1/Gupta2022.pdf

https://hr-award.math.cas.cz/documents/Presentation_Koscik.pdf

https://upv.gov.cz/prumyslova-prava/vynalezy-a-patenty

http://www.consulegis.com/wp-content/uploads/2013/06/CONSULEGIS-IP-HANDBOOK.pdf

http://www.lexmundi.com/images/lexmundi/PDF/GuidesToDoingBusiness/Guide_Norway.pdf

http://ekmair.ukma.edu.ua/bitstream/handle/123456789/18615/Nalyvaiko_Implementatsiia_acquis_YeS_u_sferi_elektronnoi_komertsii.pdf

http://oisiibrunch.com/newsview/agreement/index.htm

https://www.gov.uk/government/publications/protecting-your-uk-intellectual-propertyabroad/protecting-your-copyright-abroad

https://www.legito.cz/en/zadost-subjektu-udaju-gpdr?selectedPreset=27

http://www.risk-management.cz/clanky/Dusevni-vlastnictvi-chranene-ceskymi-pravnimipredpisy-jako-nutne-tema-pro-management-kvality-informace.pdf

https://www.nejbusiness.cz/zakony/zakon-c93-2018-sb-o-podminkach-vyuzivanigenerickych-zdroju-podle-nagojskeho-protokolu

https://beta.forskningsradet.no/en/call-for-proposals/2021/health-pilot-main-call/Download

https://doczz.cz/doc/352717/spolupr%25C3%25A1ce-saplika%25C4%258Dn%25C3%25AD-sf%25C3%25A9rou-metodika-iii

http://dspace.vsb.cz/bitstream/handle/10084/128294/BAL107_FBI_N3908_3908T005_2018.pdf?

isAllowed=y&sequence=1

https://new.fips.ru/about/vptb-otdelenie-vserossiyskaya-patentno-tekhnicheskayabiblioteka/guide-08-2021.pdf

https://www.cienciapr.org/es/aggregator?language=es&page=2607

https://www.govcert.cz/download/kiivis/Metodika_k_voditkum_pro_hodnoceni_dopadu_NUKIB_v.1.2_s_prilohou.pdf

https://www.politikaspolecnost.cz/wpcontent/uploads/2020/08/Prov%C4%9B%C5%99ov%C3%A1n%C3%ADp%C5%99%C3%ADm%C3%BDch-zahrani%C4%8Dn%C3%ADch-investic-ve-vybran%C3%BDchst%C3%A1tech-EU-IPPS.pdf

https://bergento.no/projects/

https://vubp.cz/soubory/vyzkum/projekty/V07-S4/Vsouhrn-Pracovnepravni-vztahy-aBOZP.pdf

https://www.diagnostictechnology.com.au/pages/research

https://www.dotaceeu.cz/Dotace/media/SF/FONDY%20EU/2014-2020/Dokumenty/Metodick%c3%a9%20dokumenty/MD%20VP/MD-VP_v1.pdf

http://www.euractiv.com/de/node/501154

https://www.jipitec.eu/issues/jipitec-11-3-2020/5187/hoffmann_otero_%20jipitec%20-

11_3_2020.pdf

https://www.patentstyret.no/en/search/?page=6&q=Design+Act&type=0

https://www.plass.com/cz/articles/patentova-cistota-technologii-vyrobku

https://cs.m.wikipedia.org/wiki/TRIZ

https://ihned.cz/c1-57264440-ochranna-znamka-vam-pomuze-ochranit-vas-produkt-cisluzbu-jak-si-ji-zaregistrovat-a-na-co-si-dat-pozor

https://prezentacja.www.gov.pl/attachment/6fdbe8c4-fb4e-4103-928e-7738bfd4027a

https://prosjektbanken.forskningsradet.no/project/FORISS/254696?

Kilde=FORISS&Sprak=no&calcType=funding&chart=bar&distribution=Ar&resultCount=30&sortBy=date&sortOrder=desc&source=FORISS

http://world-intellectual-property-organization.com/export/sites/www/pct/en/eqe/ip.pdf

https://www.actamup.cz/documents/file/acta/acta%20tisk%2017-1.pdf

https://www.idnes.cz/technet/internet/pri-tvorbe-vlastnich-stranek-si-dejte-pozor-na-autorskyzakon.A050719_175317_tec_byznys_kuz

http://www.plastkontakt.cz/dodavatele/15-zemedelstvi-lesnictvi-a-ekologie/1076-solarnipanely-a-kolektory/123459-vacusol-spol-s-r-o.html

http://www.thaifta.com/trade/study/theu_book3_ch3.pdf

http://www.ukrpat.com.ua/laws-wrl.php?country=Denmark&law=The_Consolidate_Patents_Act.html

http://www.vilemdanek.com/obory.shtml

http://amsdottorato.unibo.it/10393/1/paseri_ludovica_tesi.pdf

https://app.uio.no/ub/ujur/oversatte-lover/cgi-bin/sok.cgi?type=LOV

https://data.landportal.info/fr/norv%C3%A8ge

https://helda.helsinki.fi/bitstream/handle/10138/321661/hanninen_minna_v%c3%a4it%c3%b6skirja_2020.pdf?isAllowed=y&sequence=1

https://library.upol.cz/arl-upol/en/csg/?key=85883521105&repo=upolrepo

https://patents.google.com/patent/EP2684955A1/en

https://www.copyright.or.kr/business/koreacopyright/info/data/download.do?brdctsfileno=132&brdctsno=319

http://www.iphiz.com.pl/dmdocuments/Inwestor_11-2008.pdf

https://www.vsb.cz/e-vyuka/cs/subject/542-0510/01

https://wiki.knihovna.cz/index.php?title=Ochrann%C3%A1_zn%C3%A1mka

http://zakony-online.cz/?q3=&s3=

https://www.tc.cz/files_public/files/sbornik-2022-el-verze.pdf

Title: **Knowledge Transfer Specifics in Research Organizations**
Authors: RNDr. et Mgr. Růžena Štemberková, Ph.D., MPA; Ing. Lenka Scholzová; Charlotte Børing; Ing. Michal Hojdekr MBA; Ing. Petr Očko, Ph.D.; Kleng Bratveit
Editor and Editor-in-Chief: RNDr. et Mgr. Růžena Štemberková, Ph.D., MPA
The text has not undergone formal linguistic correction.
Publisher: University of South Bohemia in České Budějovice, Technology Transfer Office
Place and year of publication: České Budějovice, 2023
1st edition
ISBN: 978-80-7694-044-4

This publication has been made possible by a financial contribution from Iceland, Liechtenstein and Norway through the EEA Grants 2014-2021, Education Programme. The publisher/author is solely responsible for the content.