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Ministry of Science
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Development

TECHNOLOGY TRANSFER GUIDE

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Prof. dr Djuro Kutlaca, scientific advisor and full professor, received his doctorate at the University of Belgrade / Faculty of Organizational Sciences on the topic: Synthesis of multi-criteria methodology for evaluating the achieved technological level of the national economy sector. He participated in the implementation of 46 scientific research projects, of which 14 were international, published a total of 215 papers, of which 9 in international journals, 3 monographs of international importance, 9 monographs of national importance, 12 chapters in monographs of international importance, 21 chapters in monographs of national importance, 26 papers in national journals, 42 papers in proceedings of international conferences and 93 papers in proceedings of national conferences. He published 9 papers in the abstract. He also implemented one software package, one technical solution - a database and one patent.

Bojana Malisic, MSc - young researcher and associate at the University of Donja Gorica, a doctoral student at the Faculty of International Economics, Finance and Business, UDG, and since December 2020 she is the recipient of a prestigious scholarship for doctoral research from the Ministry of Science and Technological Development in the field of technology transfer research and innovation. During her postgraduate studies, she trained at Beijing Union University in Beijing, China, as well as BUCKS University in London, Great Britain. She collaborated on over 20 projects and researches in the field of technology transfer and connecting the academic and business sectors. Participated together with the authors prof. dr Djuro Kutlaca and Sandra Tinaj, PhD, in the preparation of the European research report of the international study "The State of University-Business Cooperation (UBC) in Europe" in which UDG participated, initiated by the European Commission.

The views and opinions expressed in this report are those of the author and do not necessarily reflect the official policy or position of the UDG

EXECUTIVE SUMMARY OF THE GUIDE

1. Technology transfer (TS) is the process of transferring scientific findings from one organization to another to for the purpose of further development and commercialization [WIPO, 2022].
2. This definition is important for Guide because it emphasizes the transfer of the results of scientific research work with the aim of its commercialization. This is exactly where all the technological transfer activities are contained, which will be the subject of further elaboration in Guide!
3. This Guide is intended for "entrepreneurial" universities where employees and students are motivated to try to commercialize the results of their scientific research work and innovation activities, while at the same time preserving and using their intellectual capital.
4. In the text that follows, instructions are given on:
    a. how to evaluate the value of the results of scientific research work and innovation activities;
    b. how to protect the intellectual property of the results - technologies that are assessed to have the required level of originality;
    c. how to commercialize results - technologies that have been previously protected; and
    d. how to promote the commercialized results and share the possibly realized financial and other profit from the commercialization of the results of scientific research work and innovation activities at the entrepreneurial university.
5. The process of technology transfer begins with research activities at the University and potentially ends with the distribution of profits from commercialized intellectual property. That process consists of the following nine activities:
    a. Research and Development (R&D)
    b. IP Disclosure
    c. Assessment
    d. IP Protection
    e. Marketing of IP
    f. Selecting a Licensees
    g. Licensing
    h. Commercialization
    i. Revenue
6. Special attention is paid to the patent protection of computer programs and food:
    a. It is not possible to obtain a patent for software in Montenegro;
    b. In Montenegro, it is possible to obtain a patent for biotechnological products.
7. In order to motivate and facilitate researchers to disseminate their research results for the benefit of society, universities and governments can put incentives in place, which will influence their involvement. A good practice within those activities is the preparation of manuals, that is, instructions on how to carry out technological transfer, that is, to protect and commercialize the intellectual property created as a result of that scientific research and innovation work. They especially stand out as extremely instrumented, easy to use and extremely understandable to a wide range of users, guides of universities in the USA. These guides serve as a model for this Guide. That's why the process of technology transfer will be presented, based on the mentioned guidelines in the USA, according to the principle of **Q and A, questions and answers.**
8. Since the set of questions in this manual was derived from reputable documents listed in the list of bibliographic references, it can certainly be expanded by interested readers. If there are such questions, the author of the Guide will be grateful to the readers and users of the Guide, to expand the next version of this document with answers to those questions as well!

AUTHOR'S NOTE

Patent activity in the areas of the Western Balkans (WB) is of very low intensity - the annual number of patent applications is very modest, so one can speak of a lack of patent culture. It is necessary to add to this finding that the main motivating factor in career development for researchers in WB is practically exclusively the publication of papers in scientific journals that are refereed in the WoS. That is why the appearance of this Guide is one of the pioneering steps in the promotion of inventiveness and, possibly, innovation that would be made by the commercialization of inventions that are the result of scientific work at Universities and Institutes, and which are protected by some form of intellectual property. The author of this document, when writing the Guide, constantly had in mind the need to translate the intellectual capital of the science sector into a knowledge-based economy.

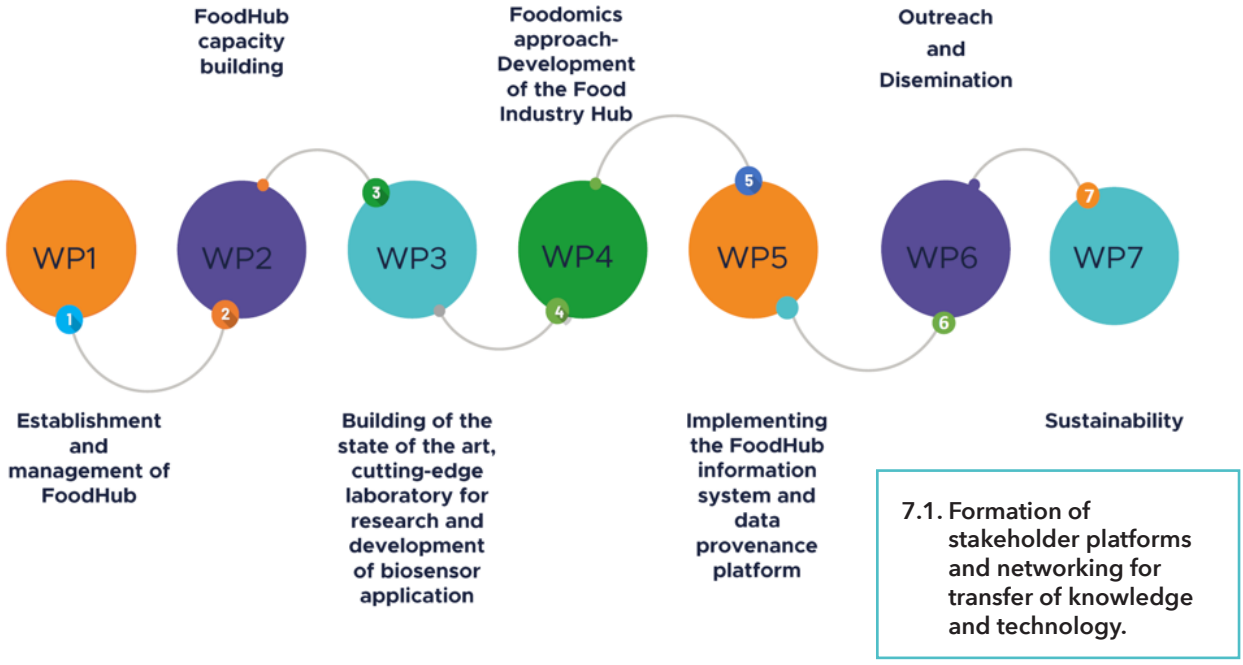
Risk Assessment area, become a strong pillar towards health protection of the whole population, foster sustainable food production in Montenegro based on native resources and new technologies. Having mentioned above, Guide for Technology transfer has developed as result of authors within UDG FoodHub - Centre of excellence for digitalization of risk assessment in the field of food safety and accurate certification of authenticity of food within Work package 7 – Sustainability - Formation of stakeholder platforms and networking for transfer of knowledge and technology.

UDG FOODHUB PROJECT

In order to give an impetus for innovative-science based development of the food sector, particularly in the area of food quality and safety, we proposed the establishment of the Centre of Excellence (CoE) with the mission to create innovations in food sector through research, knowledge-transfer, development and improvement of autochthonous and traditional food and agricultural products and resources. This project represents exactly what the University stands for, bringing new ideas into the world, into our country, and through that encouraging our students to do the same. Project is funded under grants of Ministry of Science and Technological Development for the establishment of Centres of excellence.

The overall goal of proposed CoE is to offer reliable, science-based solutions for food safety risk elimination and hazard identification, digitalized food safety risk assessment tools, reliable certification and tracing of food authenticity, promotion and ready to use applications for the food production industry and tourism sector.

Besides structured, scientific assessment of the risks involving laboratory and genetic analysis, FoodHub will address the necessity to develop appropriate software with integrated data management, data linkage and interactive food chain analyses. The software will support the possibility of analysis of cross-contamination, geographical relations, clustering and tracing. FoodHub will have an important mission to enhance and valorise existing strengths of Montenegrin food production and to create a critical mass of scientists, companies and foreign partners toward development of sustainable food production thus staying in line with the trends of EU policies. Finally, created synergy between institutions, connections with foreign partners and focus on future self-financing guarantees an extension of the proposed project into a long-term collaboration after the completion of the grant.



7.1. Formation of stakeholder platforms and networking for transfer of knowledge and technology.

CONTENTS

1. FROM KNOWLEDGE TO TECHNOLOGY

1.1. KNOWLEDGE BASED ECONOMY

The twenty-first century has been declared the century of knowledge, the century in which society and the economy develop on knowledge! It is also said that a society in which knowledge is the most important production factor is a knowledge society. In that society, the culture of knowledge creation is based on a high-quality and developed educational system, and it is infrastructurally supported by the wide application and equipment of information and communication technologies. Knowledge is now recognised as the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. The term "knowledge-based economy" stems from this fuller recognition of the place of knowledge and technology in today's economies. Science, technology and industry policies should be formulated to maximise performance and well-being in "knowledge-based economies" (KBE) – economies which are directly based on the production, distribution and use of knowledge and information. This is reflected in the trend in countries towards growth in high-technology investments, high-technology industries, more highly-skilled labour and associated productivity gains. Although knowledge has long been an important factor in economic growth, economists are now exploring ways to incorporate more directly knowledge and technology in their theories and models. "*New growth theory*" reflects the attempt to understand the role of knowledge and technology in driving productivity and economic growth. In this view, investments in research and development, education and training are key priorities for governments as well as for managers in companies [OECD, 1996].

In addition to knowledge investments, knowledge distribution through formal and informal networks is essential to economic performance. Knowledge is increasingly being codified and transmitted through computer and communications networks in the emerging "information society". Also required is tacit knowledge, including the skills to use and adapt codified knowledge, which underlines the importance of continuous learning by individuals and firms. In the knowledge-based economy, innovation is driven by the interaction of producers and users in the exchange of both codified and tacit knowledge, and in some researches it is underlined – competence development. Here special focus is on defining key competencies for wider diffusion and adoption of the technologies, even in the cases of specific technologies as High-performing computing, AI etc. [Malisic, Tinaj, 2023].

The configuration of national innovation systems, which consist of the flows and relationships among industry, government and academia in the development of science and technology, is an important economic determinant.

The science system, mainly public research laboratories and institutes of higher education, perform key functions in the KBE, including the production, transmission and transfer of knowledge. But the science system faces the challenge of reconciling its traditional functions of producing new knowledge through basic research and educating new generations of scientists and engineers with its newer role of collaborating with industry in knowledge and technology transfer. Research institutes and academia increasingly have industrial partners for financial as well as innovation purposes, but must combine this with their essential role in generic research and education.

The term "*knowledge-based economy*" stems from a more complete recognition of the role of knowledge and technology in economic growth. Knowledge, embodied in human beings (as "human capital") and in technology, has always been central to economic development. Economies depend more than ever before on the production, distribution and use of knowledge. Production and employment are expanding most rapidly in high-tech industries, such as computers, electronics, and aerospace, artificial intelligence, biotechnology.

In order to facilitate economic analysis, distinctions can be made between different kinds of knowledge which are important in the knowledge-based economy: know-what, know-why, know-how and know-who. Knowledge is a much broader concept than information, which is generally the "know-what" and "know-why" components of knowledge. These are also the types of knowledge which come closest to being market commodities or economic resources to be fitted into economic production functions. Other types of knowledge – particularly know-how and know-who – are more "tacit knowledge" and are more difficult to codify and measure. Tacit knowledge in the form of skills needed to handle codified knowledge is more important than ever in labour markets. Codified knowledge might be considered as the material to be transformed, and tacit knowledge, particularly know-how, as the tool for handling this material. Capabilities for selecting relevant and disregarding irrelevant information, recognising patterns in information, interpreting and decoding information as well as learning new and forgetting old skills are in increasing demand.

A country's science system takes on increased importance in a knowledge-based economy. Public research laboratories and institutions of higher education are at the core of the science system, which more broadly includes government science ministries and research councils, certain enterprises and other private bodies, and supporting infrastructure. In the knowledge-based economy, the science system contributes to the key functions of: i) knowledge production – developing and providing new knowledge; ii) knowledge transmission – educating and developing human resources; and iii) knowledge transfer – disseminating knowledge and providing inputs to problem solving [OECD, 1996]. The science system has traditionally been considered the primary producer of new knowledge, largely through basic research at universities and government laboratories. This new knowledge is generally termed "science" and has traditionally been distinguished from knowledge generated by more applied or commercial research, which is closer to the market and the "technology" end of the spectrum. In the knowledge-based economy, the distinction between basic and applied research and between science and technology has become somewhat blurred. There is debate as to the exact line between science and technology and whether the science system is the only or main producer of new knowledge. This debate is relevant because of different views on the appropriate role of government in funding the production of various types of knowledge.

And this is where we come to the starting point in Guide – the place and the role of the university in the creation of new technologies and the dissemination and transfer of those technologies to the economy.

The science system plays an important role in the transmission and dissemination of knowledge through the economy. One of the hallmarks of a knowledge-based economy is the recognition that the dissemination of knowledge is as important as its creation, leading to increased attention to "knowledge distribution networks" and "national systems of innovation." These are the agents and structures that support the advancement and use of knowledge in the economy and the connections between them. They are key to a country's capacity to expand innovation and to absorb and maximize the contribution of technology to production processes and product development. In addition to forming links with industry for the further diffusion of knowledge, universities and laboratories are more often asked to directly contribute to solving problems in technological research. Despite its generic character, the scientific system has always been important for generating knowledge about fruitful opportunities and practical impasses in more applied research and for directly contributing to strategic or commercial outcomes.

The knowledge economy describes the contemporary commercialization of science and academic scholarship. In the knowledge economy, innovation based on research is commodified via patents and other forms of intellectual property. The knowledge economy lies at the intersection

of private entrepreneurship, academia, and government-sponsored research. Knowledge-related industries represent a large share of the activity in most highly developed countries. A knowledge economy depends on skilled labour and education, strong communications networks, and institutional structures that incentivize innovation.

The knowledge economy is the marketplace for the production and sale of scientific and engineering discoveries. This knowledge can be commodified in the form of patents or other intellectual property protections. The producers of such information, such as scientific experts and research labs, are also considered part of the knowledge economy. The Bayh-Dole Act of 1980 was a major turning point in the treatment of intellectual property in the U.S. because it allowed universities to retain title to inventions or discoveries made with federal R&D funding and to negotiate exclusive licenses. The Bayh-Dole Act is credited with stimulating interest in technology transfer activities and generating increased R&D, commercialization, educational opportunities, and economic development in the United States. The essence of the Bayh-Dole Act was incorporated into intellectual property legislation around the world and thereby contributed to the rapid and more efficient commercialization of technologies developed at universities and public research laboratories.

Today, we are witnessing an enormous growth in the number of different ways to apply new technological knowledge, in continuously changing industrial systems. The creation of new products and processes involves the use of numerous combinations of knowledge from many, very different sources. They consist of internal sources, such as R&D, marketing and production units, and external (for the company) sources such as customers and suppliers. Knowledge can also be acquired by monitoring competitors, but also by paying great attention to the development of science and technology (ST). Innovation processes are associated with the phenomenon of technological transfer (TT). Transfer is most often based on technological innovation, and is often its consequent effect, especially within interactive and integrated and simultaneous models of innovation. Technological transfer can be defined as the infusion of technological knowledge into the market where it is sold and bought, and some theorists define transfer as "taking technology to market" [Semencenko and Kutlaca, 2004].

"*Technology transfer (TT) is a collaborative process that allows scientific findings, knowledge and intellectual property to flow from creators, such as universities and research institutions, to public and private users. Its goal is to transform inventions and scientific outcomes into new products and services that benefit society*. Technology transfer is closely related to knowledge transfer" [WIPO-int].

Traditionally, TT was understood as the circulation of patents, models, licenses and know-how. This can be considered a transfer in a narrower sense. TT is still treated in this way by many researchers. Today, TT is treated more broadly as flows of technical knowledge, in various forms, between market entities. A long list of forms and sources can be found in the literature [Semencenko and Kutlaca, 2004]:

- Sale/purchase of R&D results;
- Trade in licenses, patents, models, knowledge;
- Sale/purchase of production techniques, etc.;
- Technological advisory/consulting;
- Training of technical staff;
- Exchange of technological information.

If we simplify even more, we arrive at the following:

- Transfer of embedded technologies (i.e. knowledge flows embedded in new products, materials, tools, machines and similar devices), and
- Transfer of non-embedded technologies (i.e. other forms of technical knowledge flows).

The essence of TT is knowledge flows (a) from research institutions to companies and (b) between companies. The first is called ***vertical*** and the second ***horizontal*** transfer of technology. The purpose of flows of new technical knowledge from research units to industry is usually technological innovation, while the purpose of flows between industrial enterprises is mainly the diffusion of innovation. Therefore, diffusion should be treated as an example of horizontal TT.

Finally, from a geographical point of view, two types of TT can be distinguished:
1. Internal transfer (within the borders of one country), and
2. External transfer (import and export of technologies).

Technology according to the institutional approach, and thus technological innovation, has two dimensions:
1. It is an institution (among institutions such as the market, money, value system, norms, traditions, etc.); it is a feature of civilization that defines norms and collects the experience of rational control of the material world;
2. It also has an instrumental dimension, because it is an instrument of monitoring and shaping the world; it precisely defines, measures, constructs and builds.

Thanks to its features and dimensions, technology has become a characteristic factor that determines modern civilization. Activities within the technological transition should be based on the development of science and technology, both of which are manifested both in theory and in practice through the concept of an innovation system at the national level, which is why it is called the ***National Innovation System (NIS)*** [Semencenko and Kutlaca, 2004]. "The National Innovation System is a network of institutions in the public and private sectors whose activities and interactions initiate, introduce, modify and carry out the diffusion of new technologies" [Freeman, 1987]. In addition to this definition, the following definition is important for establishing the place of the NIS concept in development policies: "NIS is a complex network of companies, universities, R&D institutes, professional societies, financial institutions, educational and information infrastructure, state agencies and public resources, for generating, the diffusion and application of scientific and technological knowledge in a certain country" [Riccardo Galli and Morris Teubal 1997].

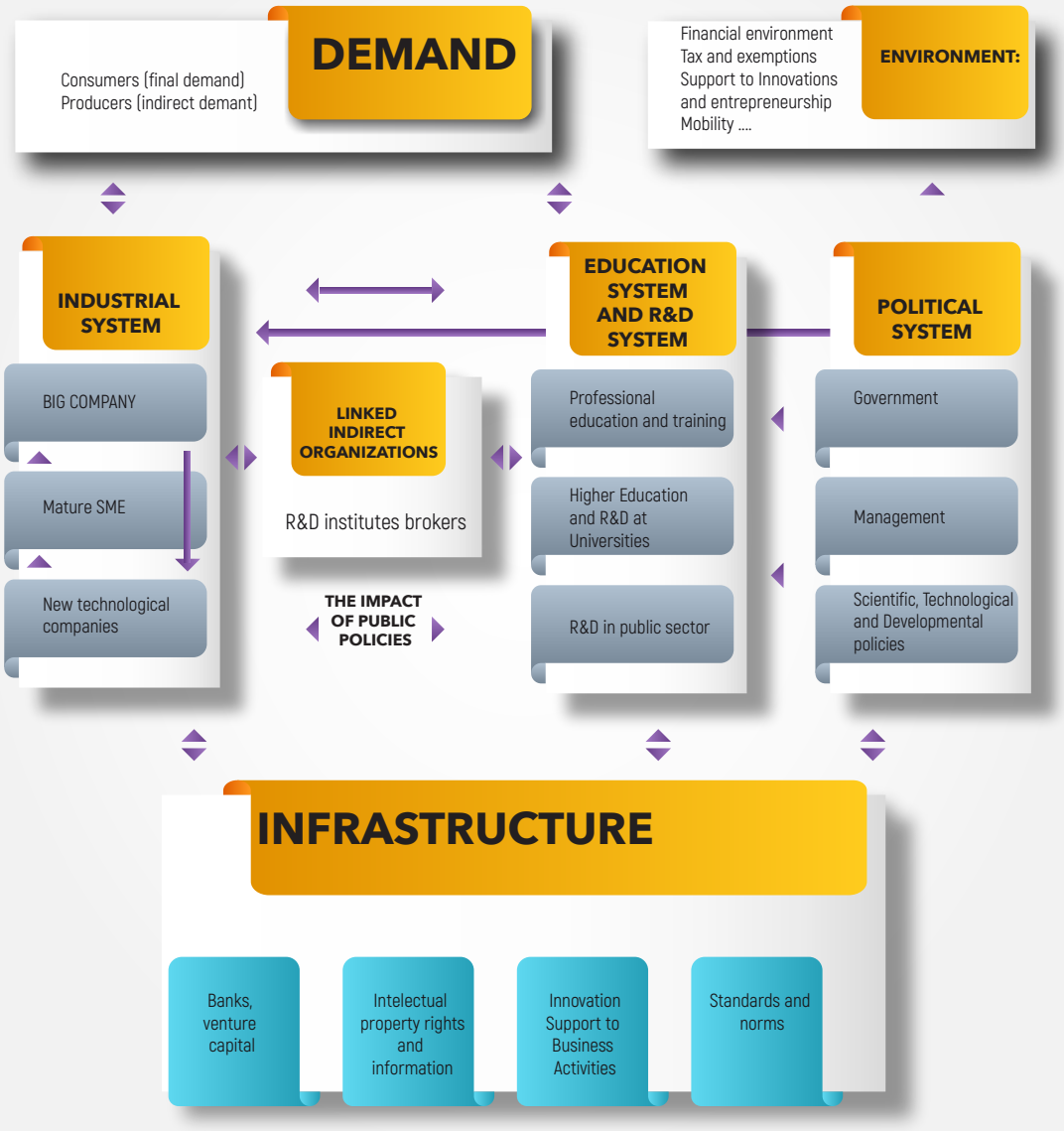
Also, it can be pointed out that within a scientific research project financed by the Ministry of science and implemented by the Faculty of International Economics, Finance and Business, UDG, Research on the national innovation capacity as a factor for the establishment of the knowledge-based economy and society of Montenegro and compatible with the innovation system of European Union, was published monograph National innovation capacity of Montenegro which aims to determine innovative capacities of Montenegro as well as testing and defining ways of integration and cooperation among National Innovation System (NIS) institutions (companies, institutes, faculties, etc.) as well as methodologies monitoring and improvement of process performance at the enterprise level by processes: procurement, marketing, production, research, design and development.
The research done made it possible to define barriers before the flow of knowledge, ideas and technologies, ensuring national integration intellectual and development communities into a powerful concentration of knowledge at the European and world level, creating a prerequisite for enables the realization of capital NIIPs of national or regional importance the most effective transfer of knowledge, technology and good practices in construction and operation of the national innovation system. This I was the first research aimed at building NIK Montenegro. [Tinaj and Kutlača, 2015]
All this is further clarified by the definition of technological innovation as "new knowledge or a new combination of existing knowledge used for economic purposes" [Edquist and Johnson, 1997]. Innovation can be considered as the result of learning, which by its nature is an interactive and cumulative process. Interactions in the economy combine different knowledge or create new ones, which sometimes results in a new product or process. Interactions are carried out,

not only with R&D units, but also with other sectors within the company, between companies and customers, between different companies, between companies and state institutions, etc. Technological development is, therefore, the product of a complex interaction: companies, R&D institutes, universities, professional societies, educational and information infrastructure, financial institutions, government agencies and public resources. Richard Nelson called this complex network of companies, other organizations and institutions the "*capitalist growth machine*" [according to: Albuquerque, 1997], and some years later the *national innovation system* [Nelson, 1993].

According to the Oslo manual [OECD, 1992; OECD, 2018]: Innovation is used for the successful commercial (market) application of an invention – obviously, not all inventions end up as innovations! There are three fundamental requirements for an invention to qualify for a standard invention patent:

- the invention must be new,
- useful, and
- it must prove the inventive step, that is, it must not be obvious to experienced practitioners in the respective technological field.

SHEME OF GENERAL CONCEPT NIS [ACCORDING: KUHLMANN, 2003]



Scientific and technological innovation is the transformation of an idea into a new or improved product on the market, into a new or improved production / work process for industry and commerce, or a new approach in social services. Technological innovations include new products and processes and significant technological changes to existing products and processes. An innovation is applied if it is implemented on the market (production innovation) or used in the production process (process innovation).

An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process) [OECD, 2018].

Business innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm. Innovation activities can result in an innovation, be ongoing, postponed or abandoned. Business innovation activities include [OECD, 2018]:

1. Research and experimental development (R&D) activities.

Research and experimental development activities (R&D) comprises creative and systematic work undertaken in order to increase the stock of knowledge and to devise new applications of available knowledge. According to the Frascati Manual 2015 definition (OECD, 2015: § 2.5 to 2.7), R&D activities must meet five criteria:

(i) novel;
(ii) creative;
(iii) address an uncertain outcome;
(iv) systematic; and
(v) transferable and/or reproducible.

R&D comprises basic research, applied research, and experimental development. R&D as an innovation activity: by definition, applied research is directed towards a specific practical aim or objective, while experimental development seeks to produce new products or processes or to improve existing products or process. Hence, there is an intention for innovation. Although basic research to enlarge a firm's knowledge stock may not be used to pursue specific innovations during the observation period, for practical reasons, all types of R&D carried out or paid for by business enterprises are considered by definition as innovation activities of those firms.

BUSINESS INNOVATION ACTIVITIES

2. ***Engineering, design and other creative work activities.***
   Engineering, design and other creative work activities cover experimental and creative activities that may be closely related to R&D, but do not meet all of the five R&D criteria. These include follow-up or auxiliary activities of R&D, or activities that are performed independently from R&D. Engineering involves production and quality control procedures, methods and standards. Activities include the planning of technical specifications, testing, evaluation, setup and pre-production for goods, services, processes or systems; installing equipment, tooling up, testing, trials and user demonstrations; and activities to extract knowledge or design information from existing products or process equipment ("*reverse engineering*"). For many service firms, design and other creative work constitutes their main creative activity for innovation. While these activities often result in knowledge, they seldom meet the functional novelty and uncertainty requirements for R&D, or are conducted on an ad hoc basis.
   Design includes a wide range of activities to develop a new or modified function, form or appearance for goods, services or processes, including business processes to be used by the firm itself. The goal of product design is to improve the attractiveness (aesthetics) or ease of use (functionality) of goods or services. Process design, which can be closely linked to engineering, improves the efficiency of processes. Common features of product design activities include involving potential users in the design process (through surveys of potential users, ethnographic research, co-creation, or project user groups), pilot testing on a sample of potential users, and post-implementation studies to identify or solve problems with a particular design.
   Other creative work includes all activities for gaining new knowledge or applying knowledge in a novel way that do not meet the specific novelty and uncertainty (also relating to non-obviousness) requirements for R&D. Other creative work includes ideation (the creative process of generating new ideas), the development of concepts for innovations, and activities related to organisational change as part of product or business process innovation activities. Engineering, design and other creative work as an innovation activity: most design and other creative work are innovation activities, with the exception of minor design changes that do not meet the requirements for an innovation, such as producing an existing product in a new colour. Identifying the use of design thinking methodologies by firms can help to differentiate minor design changes from innovation activities. Many engineering activities are not innovation activities, such as day-to-day production and quality control procedures for existing processes. Engineering activities for reverse engineering, or to alter or introduce new production processes, services or delivery methods, may or may not be an innovation activity, depending on whether these activities are conducted for innovation or for other reasons.

3. **Marketing and brand equity activities.**
   Marketing and brand equity activities include market research and market testing, methods for pricing, product placement and product promotion; product advertising, the promotion of products at trade fairs or exhibitions and the development of marketing strategies. They also include advertising for trademarks that are not directly related to a specific product, such as advertising linked to the firm's name, as well as public relations activities that contribute to a firm's reputation and brand equity. Sales and distribution activities are not part of marketing and brand equity activities. Marketing and brand equity activities as an innovation activity: marketing activities for existing products are only innovation activities if the marketing practice is itself an innovation. For many companies, only a small fraction of marketing expenditures is likely to be linked to product innovations introduced within the observation period. Relevant innovation activities include preliminary market research, market tests, launch advertising, and the development of pricing mechanisms and product placement methods for product innovations. In some cases, the advantages of a business process innovation could also be marketed, for instance if the business process innovation has environmental benefits or improves product quality.

4. **Intellectual property (IP) related activities.**
   Intellectual property (IP) related activities include the protection or exploitation of knowledge, often created through R&D, software development, and engineering, design and other creative work. IP activities include all administrative and legal work to apply for, register, document, manage, trade, license-out, market and enforce a firm's own intellectual property rights (IPRs), all activities to acquire IPRs from other organisations such as through licensing-in or the outright purchase of IP, and activities to sell IP to third parties. IPRs include patents, utility patents, industrial designs, trademarks, copyright, integrated circuit designs, plant breeder's rights (new plant varieties), geographical indications and confidential information such as trade secrets. IP- related activities as an innovation activity: IP activities for ideas, inventions and new or improved products or business processes developed during the observation period are innovation activities. Examples include activities to apply for IP rights for an innovation or for an invention, licensing-in the right to use an invention or an innovation, or licensing-out IP for inventions and innovations. All IP activities for inventions made before the observation period and for products and business processes that existed before the observation period should be excluded. Respondents to data collection exercises may find it difficult to differentiate IP activities for innovation from IP activities for existing products or business processes, particularly if IP is managed in a separate division with its own budget and there is a large IP portfolio under management.

5. **Employee training activities.**
   Employee training includes all activities that are paid for or subsidised by the firm to develop knowledge and skills required for the specific trade, occupation or tasks of a firm's employees. Employee training includes on-the-job training and job-related education at training and educational institutions. Employee training as an innovation activity: employee training activities for the use of existing products or business processes, the upgrading of general skills, or language training are not innovation activities. Examples of training as an innovation activity include training personnel to use innovations, such as new software logistical systems or new equipment; and training relevant to the implementation of an innovation, such as instructing personnel or customers on the features of a product innovation. Employee training that is required to develop an innovation, such as training for R&D or for design, are respectively part of R&D activities or part of engineering, design and other creative work.

6. ***Software development and database activities.***
   Software development and database activities include:
   - The in-house development and purchase of computer software, programme descriptions and supporting materials for both systems and applications software (including standard software packages, customised software solutions and software embedded in products or equipment).
   - The acquisition, in-house development and analysis of computer databases and other computerised information, including the collection and analysis of data in proprietary computer databases and data obtained from publicly available reports or the Internet.
   - Activities to upgrade or expand the functions of information technology (IT) systems, including computer programmes and databases. This includes statistical data analysis and data mining activities.

   Costs associated with the use of and access to computer and other information and communication technology (ICT) services, such as cloud storage and processing services, can be part of software development and database activities if incurred with that purpose. However, computer and IT services to maintain hardware systems are generally not a software development and database activity. Software development and database activities include activities that may be unrelated to innovation, such as minor upgrades to existing software (either developed in-house or purchased) and the purchase and analysis of databases for accounting and other routine business functions. Software development and database

activities as innovation activity: software development is an innovation activity when used to develop new or improved business processes or products, such as computer games, logistical systems, or software to integrate business processes. Database activities are an innovation activity when used for innovation, such as analyses of data on the properties of materials or customer preferences.

7. ***Activities related to the acquisition or lease of tangible assets***
   Activities related to the acquisition or lease of tangible assets include the purchase, lease, or acquisition through a takeover of buildings, machinery, equipment, or the in-house production of such goods for own-use. Equipment includes items such as instruments, transport equipment and computer hardware for IT systems. Tangible assets owned by the firm remain in corporate balance sheets for more than one year. The acquisition of tangible assets is covered within the category of gross fixed capital formation in national accounts for the relevant asset categories. A firm's financial statements will provide information on expenditures for additions to property, plant and equipment. Balance sheets will reflect the overall value of the stock of assets. In addition to acquiring or developing on own account such assets, firms may secure their services by leasing or renting them from external parties. This includes payments for cloud services to use assets such as servers. Such costs represent an indirect measure of use. Acquisition or lease of tangible assets for innovation: the acquisition or lease of tangible assets can be innovation activities in their own right, such as when a firm purchases or leases equipment with significantly different characteristics than the existing equipment that it uses for its business processes. The acquisition of tangible capital goods is generally not an innovation activity if it is for replacement or capital-widening investments that are unchanged, or if it consists of only minor changes compared to the firm's existing stock of tangible capital. The lease or rental of tangible assets is an innovation activity if these assets are required for product or business process innovations. The measurement of innovation activity should be robust to business decisions on whether to own outright or rent an asset to be used for innovation. For example, leasing additional building space for a design lab may be an innovation activity. Likewise, the use of third-party cloud services for transforming and making operations more efficient may contribute to a business process innovation or support the delivery of new products to customers.

8. ***Innovation management activities.***
   Innovation management includes all systematic activities to plan, govern and control internal and external resources for innovation. This includes how resources for innovation are allocated, the organisation of responsibilities and decision-making among employees, the management of collaboration with external partners, the integration of external inputs into a firm's innovation activities, and activities to monitor the results of innovation and to support learning from experience. Innovation management includes activities for establishing policies, strategies, objectives, processes, structures, roles and responsibilities to deal with innovation in the firm, as well as mechanisms to assess and review them. Information on innovation management is relevant to research on the efficiency of expenditures on innovation activities to generate sales or other innovation outcomes. Innovation management practices are relevant to innovation-active firms, although the degree of formality and the complexity of these practices can differ considerably between firms. Respondents from firms with only ad hoc innovations based on the acquisition or lease of tangible assets may not recognise that their firm has innovation management practices. As innovation management activities are not relevant to non-innovative firms, it is recommended to collect qualitative data on innovation management practices for innovation-active firms only. An innovation management practice that is potentially relevant to all firms is searching external sources for ideas for innovation. Firms that search external sources for ideas will not be innovation-active if they decide not to develop an idea during the observation period. It is recommended to collect data on search activities in questions on knowledge sources for innovation for all types of firms if possible.

The *Draft International Code of Conduct on the Transfer of Technology* defined ***technology*** *as the systematic knowledge for the application of a process that results in the manufacture of a product or the delivery of a service*. Further, "*technology refers to the theoretical and practical knowledge, skills, and artefacts that can be used to develop products and services as well as their production and delivery systems*". Technology can be embodied in people, materials, cognitive and physical processes, plant, equipment and tools. On the basis of the above definition of technology, the Code defined ***transfer of technology*** as "*the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the mere sale or lease of goods*". From this, five categories of transactions could represent transfer of technology as follows [UNCTAD, 2014]:

- The assignment, sale and ***licensing*** of all forms of industrial property, except for trade-marks, service marks and trade names when they are not part of technology transfer transactions;
- The provision of ***know-how*** and technical expertise in the form of feasibility studies, plans, diagrams, models, instructions, guides, formulae, basic or detailed engineering designs, specifications and equipment for training, services involving technical advisory and managerial personnel, and personnel training;
- The provision of ***technological knowledge*** necessary for the installation, operation and functioning of plant and equipment, and turnkey ***projects***;
- The provision of ***technological knowledge*** necessary to acquire, install and use machinery, ***equipment***, intermediate goods and/or raw materials which have been acquired by purchase, lease or other means;
- The provision of technological contents of industrial and technical ***cooperation arrangements*** [UNCTAD, 1985].

Foreign direct investments (FDI) are the main driver in the creation, transfer and diffusion of technologies. The largest and most important source and implementer of the aforementioned FDI are multi (trans)national companies (TNCs). The role of FDI undertaken by TNCs in the generation, transfer and diffusion of technology is the following [UNCTAD, 2014]:

1. Role of TNCs in *technology generation*
   TNCs tend to centralize their R&D facilities in their home countries. On the whole, developing countries continue to attract only marginal portions of foreign affiliate research, and much of what they get relates to adaptation and technical support rather than innovation.

2. Role of TNCs in *technology transfer*
   TNCs transfer technologies directly to foreign host countries in two ways: internalized to affiliates under their ownership and control, and externalized to other firms. Internalized transfer takes the form of direct investment and is, by definition, the preserve of TNCs. It is difficult to measure and assess directly the amounts of technology transferred in this manner. Externalized modes of transfer by TNCs take a variety of forms: minority joint ventures, franchising, capital goods sales, licences, technical assistance, subcontracting or original equipment-manufacturing arrangements.
   Given the existence of a commercially feasible choice, the advantages to development from an internalized transfer include:

- the provision of financial resources along with technology;
- the possibility of expanding the technological base of the host economy (though this is not exclusive to internalized transfer);
- the use of advanced technology that may not be available through externalized transfer or the use of mature technology applied in an international production network;
- greater speed of transfer:
- access to the technological assets of a TNC providing essential components as well as offering learning opportunities for the host economy.
- The disadvantages of internalized transfer include:

- The host economy must pay for the entire "package" brought by a TNC which, in addition to technology, may include brand names, finance, skills and management. Internalized transfer may prove more expensive than externalization, especially where local firms already possess these other components of the package.
- The retention of technology and skills within the network of a TNC may hold back deeper learning processes and spillovers into the local economy, especially where the local affiliate is not developing R&D capabilities.

3. Role of TNCs in *technology diffusion*
   The use of new technology by a recipient is only one of its benefits that the recipient's economy obtains from that technology. Another, often larger, benefit is the diffusion of technology and skills within the host economy. Many forms of diffusion are not priced or paid for in markets. They are externalities that arise involuntarily or are deliberately undertaken to overcome information problems. Thus, in response to the presence of TNCs, local firms and industries may become linked into the technological processes of those firms through "demonstration effects", as where domestic firms seek to imitate the technology applied by TNCs, and to compete with TNCs by improving their technological capabilities and raising productivity. Even more importantly, diffusion can occur through cooperation between foreign affiliates and domestic suppliers and customers, leading to technology transfer to vertically linked firms and service providers. Furthermore, labour mobility from foreign affiliates to domestic firms, particularly of highly skilled personnel, can stimulate technological development.
   On the other hand, such spillover effects may not be inevitable, as where a TNC closely guards its competitive advantage in its technology, whether through its retention within the TNC network, and/or through limited skills transfer to employees and/or through restrictive terms in employee contracts, preventing them from revealing technical secrets or from working for direct competitors for a set period of time.

1.2. TECHNOLOGY TRANSFER – DEFINITIONS

Technological transfer (TT) is defined in the main methodological documents of international organizations relevant to the governance of scientific and technological development at the global level: UN, OECD, WIPO. The regulation and organization of statistical monitoring of scientific research and innovation activities by UNESCO-UIS, EUROSTAT, OECD, and World Bank is particularly emphasized here. At the same time, all the mentioned international organizations cooperate with each other and harmonize methodologies, methods and techniques in the field of governance and statistics of science and innovation. When it comes to the application of those methodological standards, instructions and procedures, the "inventiveness" and "imagination" of national institutions and individuals can be observed. Whether it is ignorance of international standards or, perhaps, disagreement with them, or, simply, the desire to use one's own definition, methodology, procedure and the like, is difficult to figure out. An obvious example of this, in the opinion of the author of the Guide, unnecessary "inventiveness", is a large number of definitions of technological transfer, of which the following examples are cited:

- Technology transfer is the movement of knowledge and discoveries to the general public. It can occur through publications, educated students entering the workforce, exchanges at conferences, and relationships with industry. For the purposes of this guide, however, technology transfer refers to the formal licensing of technology to third parties, under the guidance of professionals employed by universities, research foundations and businesses, in departments focused on these activities [MIT, 2010].
- Technology transfer is the movement of knowledge and discoveries from the university to benefit the general public. it occurs in many ways: through research publications, exchanges at scientific conferences, and informal and formal relationships with industry. Most

importantly, technology transfer occurs via educated students entering the workforce. for the purposes of this guide, however, technology transfer (commonly known as "tech transfer") refers to the formal licensing of technology and intellectual property to third parties [Stanford University, 2012].

- Technology transfer is broadly defined as the overall process by which knowledge, facilities, or capabilities promote U.S. innovation and industrial competitiveness in order to enhance economic security and improve quality of life. It can occur in many ways, such as through publications, exchanges at conferences, and relation-ships with industry. However, for the purposes of this guide, "technology transfer" refers to the formal licensing of technology and IP to other parties to benefit University, the rest of Johns Hopkins University (JHU), sponsors, the nation, and, when appropriate, international persons [Johns Hopkins University, 2019]. Here it is interesting to quote the distinction between TT and technological transition: "Transition is typically made directly to the U.S. government or a government-selected contractor for further development of the technology and/or production and integration into operational systems. Technology transition is the primary method by which University transfers knowledge/IP to the U.S. government in furtherance of University's mission. Transfer is typically made to an industrial/commercial entity for the purpose of generating new products or services for public use" [Johns Hopkins University, 2019].
- Technology transfer is a process by which knowledge and discoveries are disseminated to the public. It can occur through publications, educated students entering the workforce, exchanges at conferences, and relationships with industry, among other things. In this guide, technology transfer is a general term that refers to the formal licensing of technology to third parties under the guidance of professionals employed by universities, research foundations and businesses [Ohio State University, 2019].
- Technology transfer is the movement of knowledge and discoveries to the general public. It can occur through publications, graduates entering the workforce and relationships with government entities, not-for-profit organizations, and industry, among others. In this guide, technology transfer refers to the licensing of inventions to a third party and describes some of the ways U of T can support this process [University of Toronto, 2021].
- Technology transfer is the movement of knowledge and discoveries to the general public. It can occur through publications, educated students entering the workforce, exchanges at conferences, and relationships with industry. For the purposes of this guide, however, technology transfer refers to the formal licensing of technology to third parties, under the guidance of professionals employed by universities, research foundations, and businesses, in departments focused on these activities. Use of the term "technology" in this context reflects the dominance of the field by discoveries in the life sciences, physical sciences, and information technology, but should not be interpreted to mean that the field is limited to such areas. For the purposes of this guide, "technology" encompasses all intellectual property that might be created within a university, including inter alia inventions; tangible research materials; software, books, multimedia, or audio-visual materials; and artistic works [Brandeis University, 2023].

The above definitions are useful from the point of view of further elaboration of the technology transfer process itself, because they contain most of the main activities, institutions and individuals involved in this process. Nevertheless, we end this "list" of definitions with the definition of a meritorious international organization - WIPO:

Technology transfer is the process of transferring scientific findings from one organization to another to for the purpose of further development and commercialization [WIPO, 2022].

This definition is important for Guide because it emphasizes the transfer of the results of scientific research work with the aim of its commercialization. This is exactly where all the technological transfer activities are contained, which will be the subject of further elaboration in Guide!

1.3. INTELLECTUAL PROPERTY IN MONTENEGRO

In a knowledge-based economy intellectual property plays a significant, key role. New products, brands and creative designs that appear on the market every day are the result of human innovation and creativity, and the main drivers of these innovations are both small and medium-sized enterprises and universities and public laboratories [Karanikić Petra and Koprivica Mladen M., 2020].
The role of intellectual property rights protection is to give individuals or companies and organizations an incentive to create new and socially desirable and useful innovations. Protected intellectual property can become a valuable asset for either an individual or a company or organization if it is used commercially in an appropriate manner. In this context, property can be seen as:

1. Material or tangible assets (e.g. buildings, machines, plants, etc.), and
2. Intangible or intangible assets (human capital, knowledge and experience, ideas, brands, design, etc.).

The role of these intellectual property protection rights is to "transform" intangible property into tangible property and in this way create valuable and in certain cases exclusive property that can be traded on the market. Given that intellectual property has all the characteristics of property, it means that it can be disposed of like any other property: it can be sold, given for use, and it can also be inherited [Karanikić Petra and Koprivica Mladen M., 2020].

Intellectual property protection rights enable companies and organizations to:

- prevent others from copying their products and services, or using their innovations, which is especially important today in conditions of increased competition on the market,
- create a strong brand of their products/services by differentiating those products/services through the strategic use of several different forms of intellectual property rights,
- get useful and valuable information - analysis of commercial and technical information available from protected industrial property (patent, trademark, industrial design, etc.) can help companies and organizations in

INTELLECTUAL PROPERTY BELONGS TO THE CATEGORY OF INTANGIBLE OR INTANGIBLE PROPERTY.

AN INDIVIDUAL OR COMPANY OR ORGANIZATION CAN PROTECT THE FOLLOWING FORMS OF INTANGIBLE PROPERTY:

01 Innovative products or processes - by patent or utility model,

02 Cultural, artistic and literary works including, in certain countries, software and databases copyright or related rights,

03 Creative design, including textile design - industrial design,

04 Recognizable signs - trademark,

05 Products of a certain quality or reputation that come from a certain geographical area - name of origin and geographical indication,

06 Microchips - semiconductor topography, and

07 Information of commercial value - trade secret.

understanding various technological trends on the market and identifying areas of future technological research and development, thus shortening the required time and reducing research and development costs for their own products and/or services,

- generate income through licensing, franchising or other ways of commercial use of their own intellectual property,
- realize the possibility of financing from different sources - property that is protected by certain forms of intellectual property rights protection can be assessed for its value and, based on that value, obtain the necessary further financing,
- increase their own commercial value,
- open new markets,
- achieve different forms of business cooperation - intellectual property protection rights provide a basis for collaborative cooperation, such as collaborative cooperation in research and development, and
- ensure the so-called business freedom - owning or licensing key forms of intellectual property rights protection can reduce the business risk of companies and organizations in terms of infringement of other people's intellectual property rights.

The Office for Intellectual Property is the fundamental national institution for the protection of intellectual property in Montenegro. The Office for Intellectual Property of Montenegro was founded on May 11, 2007 as a special body in the state administration system, and since 2017 it has been functioning as an independent body within the Ministry of Economic Development and Tourism of Montenegro as Directorate for Intellectual Property. The Ministry of Economic Development and Tourism of Montenegro is responsible for the preparation of regulations in the field of intellectual property.

Intellectual property rights are set out in Article 27 of the Universal Declaration of Human Rights, which emphasizes the right to the protection of creativity. The greatest achievements of civilization are the first international treaties in the field of intellectual property, namely the Paris Convention for the Protection of Industrial Property in 1883 and the Berne Convention for the Protection of Literary and Artistic Works in 1886. The Principality of Montenegro was a member of the Berne and Paris Conventions as the oldest international sources of law since 1 July 1893. The Constitution of Montenegro guarantees the protection of intellectual creativity in Articles 76 and 77. Montenegro became a member of the World Intellectual Property Organization on December 4, 2006, by the act of notifying 19 international treaties ratified by predecessor countries. The most important elements of national legislation in Montenegro in the field of intellectual property protection in Montenegro are the following forms of protection [Karanikić Petra and Koprivica Mladen M., 2020]:

I. A patent protects an invention that must be new and must be industrially applicable. Protection lasts for 20 years from the date of filing the patent application. The advantages of such protection are:
- exclusive patent exploitation rights = economic benefit + protection (security);
- strengthening market influence;
- the possibility of licensing/selling technology;
- stronger position in potential negotiations;
- a positive image among consumers, business partners, potential investors, shareholders and society as a whole.

II. Legal ownership of a sign is acquired by trademark registration, i.e. protection of the sign, which enables the identification of products and services. The basic conditions that a sign must meet in order to become a trademark are that it is distinctive, i.e. that it is not similar to an earlier trademark. The legal protection of a sign with a trademark enables its highlighting on products/services and packaging, offering such products/services, storage, import and export of goods, use of the sign on business documents and for advertising purposes.

III. Industrial design protection represents design protection, it enables the identification of

products/services and their sources, and protects the external appearance of the product. Therefore, the ornamental or aesthetic aspect is protected, and not the technical or functional aspect of the form. 2D and 3D shape that must be new can be protected. Protection lasts a maximum of 25 years.

IV. A geographical indication is the name of a geographical area or some other sign that indicates that a product or service originates from a certain geographical area, as well as that it possesses certain quality and properties attributed to that area.

V. The designation of origin is a more specific form of protection and necessarily implies the significant or exclusive influence of special natural and human factors of a certain geographical environment from which the special quality and properties of goods or services arise.

VI. Topography as a representation of the three-dimensional arrangement of layers of conductor-insulation and semiconductor material in semiconductor products as a result of the intellectual effort of its creator. It is intended to perform a certain electronic function.

This is a list of national regulations in the field of intellectual property protection in Montenegro:

1. LAW ON THE APPLICATION OF REGULATIONS GOVERNING THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS ("Official Gazette of the Republic of Montenegro", No. 045/05 dated 28.07.2005, Official Gazette of Montenegro", No. 073/10 from 10.12.2010, 037/11 from 29.07.2011, 040/11 from 08.08.2011, 018/14 from 11.04.2014, 042/15 from 29.07.2015, 042/16 from 11.07.2016)
2. Law on Patents ("Official Gazette of Montenegro" No. 42/2015, 2/2017 and 146/21) fully harmonized with international standards and European standards as well as with the Law on Administrative Procedure
3. Rulebook on patents ("Official Gazette of Montenegro No. 8/2016")
4. Law on Copyright and Related Rights ("Official Gazette of Montenegro", No. 037/11 of 29 July 2011),
5. Law on Trademark (Official Gazette of Montenegro 72/2010, 44/2012, 18/2014, 40/2016 and 2/2017)
6. Law on Amendments to the Law on Trademarks ("Official Gazette of Montenegro", No. 018/14 of April 11, 2014),
7. Law on Amendments to the Law on Legal Protection of Industrial Design ("Official Gazette of Montenegro", No. 042/16 of 11 July 2016),
8. Law on Indications of Geographical Origin (Official Gazette of Montenegro 48/2008),
9. Law on Protection of Topographies of Semiconductors (Official Gazette of Montenegro 75/2010 and 40/2016),
10. Law on Optical Discs (Official Gazette of Montenegro 27/07 and 53/11)
11. Law on indications of origin, geographical indications and indications of guaranteed traditional specialties of agricultural and food products (Official Gazette of Montenegro 18/11),
12. Law on Protection of Plant Varieties (Official Gazette of Montenegro, Nos. 48/07 and 48/08),
13. Law on the Implementation of the Regulations Governing the Protection of Intellectual Property Rights (Official Gazette of Montenegro No. 045/05 of 28.07.2005, Official Gazette of Montenegro No. 073/10 of 10.12.2010, 037/11 of 29.07.2011, 040/11 from 08/08/2011, 018/14 of 11/04/2014, 042/15 of 29/07/2015),
14. Law on Administrative Procedure ("Official Gazette of Montenegro", no. 56/2014, 20/2015, 40/2016 and 37/2017)
15. Law on administrative fees ("Official Gazette of the Republic of Montenegro" No. 55/03, 46/04, 81/05, 2/06, "Official Gazette of Montenegro" No. 22/08, 77/08, 3/09, 40/2010, 45/2014, 53/2016 and 37/2017)
16. Decision on the amount of compensation for the special costs of the proceedings conducted by the Institute for Intellectual Property and reimbursement of costs for the provision of information services of the Institute ("Official Gazette of Montenegro", No. 2/08)
17. LAW ON ADMINISTRATIVE FEES ("Official Gazette of Montenegro", No. 018/19 of March 22, 2019)

Pursuant to intellectual property rights regulation in Montenegro[1)] and Rulebook on Protecting Intellectual Property Rights at the University of Donja Gorica, Center of Excellence team in cooperation with experts has prepared Intellectual Property Management Plan with main objectives:

a. Promoting all types of intellectual property, patenting, licensing, and rapid commercialization ect. of Subject Inventions developed under CoE, and
b. Promoting the rapid dissemination of scientific data for the public good

1.4. FOUR MISSIONS OF THE UNIVERSITY

A university can have several missions, of which the following four missions are most often found in the literature:

1. The first and basic mission of the university is education - universities that have only this mission are called "teaching" universities;
2. The second mission of the university is scientific research work - universities that, in addition to education, also have organized scientific research work, are called "research" universities. In order to better and more efficiently organize scientific research work, scientific institutes and research laboratories are established at universities;
3. The third mission of the university, in addition to education and scientific research work, is the commercialization of the results of scientific research work. Universities with a pronounced third mission are called "entrepreneurial" universities. In order to organize the efficient and effective commercialization of the results of scientific research work and the transfer of technologies developed at the university into the economy, spin-off companies, business-technology incubators, as well as technology transfer offices, offices for the protection of university intellectual property, are established at entrepreneurial universities;
4. The fourth mission of the university is involvement in the activities of responsible governance of research and innovation. Such universities represent the fourth helix of the university-industry-government-public-environment interactions within a knowledge economy.

This ***Guide*** is intended for "***entrepreneurial***" universities where employees and students are motivated to try to commercialize the results of their scientific research work and innovation activities, while at the same time preserving and using their intellectual capital. In the text that follows, instructions are given on:

- how to evaluate the value of the results of scientific research work and innovation activities;
- how to protect the intellectual property of the results - technologies that are assessed to have the required level of originality;
- how to commercialize results - technologies that have been previously protected; and how to promote the commercialized results and share the possibly realized financial and other profit from the commercialization of the results of scientific research work and innovation activities at the entrepreneurial university.

1. Montenegro has been a member of WIPO (World Intellectual Property Organization) since 2006. The Decree on Public Administration Authorities Organisation and Manner of Work of 11 May 2007 (Official Gazette of Montenegro, No.25 / 07) established the Intellectual Property Office of Montenegro, which began its operation on 28 May 2008 (Official Gazette of Montenegro, no. No. 30/2008). The establishment of this office enabled the establishment of legal framework for regulation of this area as well. With the Decree on Amendments to the Decree on the Public Administration Organization and Manner of Work (Official Gazette of Montenegro, No. 19/2017), the Intellectual Property Office of Montenegro became an organ within the Ministry of Economy.Intellectual property rights in Montenegro are regulated through a set of laws.

2. ENTREPRENEURIAL UNIVERSITIES FOR PRODUCTION OF KNOWLEDGE AND TECHNOLOGIES

Discussions about the university as an institution that "*produces knowledge*" are aimed at establishing a model that represents the now expanded understanding of the university not only as a social (with regard to norms, motives and organizational structures), but also as an economic organization (an organization that translates a set of inputs into an output with a newly created value, depending on costs and income) [Kutlača Đuro, 2004]. The evolution of the role and importance of the university is illustrated by two theoretical models of "knowledge production" [Gibbons 1995]. The first, Mode 1, generalizes the institution of the university as it generally existed until the 60s of the XX century and had the following characteristics:
(a) the university is a producer of knowledge for the sake of knowledge itself,
(b) prepares students for a professional career,
(c) is structured according to well-defined disciplines, and
(d) has a status regulated by law.

Mode 2 consists of the following characteristics of "knowledge production":
(a) knowledge is produced in the context of the application,
(b) knowledge production is transdisciplinary,
(c) heterogeneity and organizational diversification,
(d) increased social responsibility,
(e) broad-based quality control system.

The new mode is reflected in the redefinition of the social goals of the university education system - the university must respond to the following tasks in the XXI century [Geuna, 2000]:
(1) to reproduce the existing level of knowledge,
(2) to improve the critical abilities, knowledge and capabilities of the individual, by being:
    - input for the activities of the individual in the activities of public and private life and
    - input for the development of a democratic, civilized society,
(3) to increase the knowledge base:
    - in order to advance science, and
    - in order to apply science to increase the general wealth, and
(4) to provide specific training and general research support to the needs of the knowledge-based economy at local, regional and national levels.

The first two goals correspond to the traditional role of the university as an institution that preserves and transmits knowledge, culture and social values through education. The third goal, although it also refers to the traditional role of the university as a place where knowledge is produced through research and improvement, expands the role of the university to the institution that creates the so-called "useful / usable" knowledge that can further be used elsewhere in order to increase the general benefit for society. Finally, the fourth goal describes the new role of the university, which is now treated as a direct participant in economic development. This is the role of the university to meet the need for knowledge through learning and research for the purpose of economic development at the local, regional and national level [Geuna, 2000].

The literature singles out the following three confrontational trends as the main drivers of changes in the system of university education and research in the second half of the 20th century [Geuna, 2000; Clark, 1998]:

(1) Elite higher education vs. Mass higher education;
(2) Basic research (research curiosity) vs. Targeted, applied research, that is, Free (according to

the research curiosity of university researchers) moving the boundaries of knowledge vs. Research initiated by the needs of society;
(3) Private and industry funding vs. Public financing (budget).

The reaction and, probably, part of the answer to the exposed situation in the search for solutions for the transformation of the university, is found in the concept of the entrepreneurial university [Clark, 1998]. In short, this concept implies an entrepreneurial reaction to the growing imbalance between the university and its environment (society, economy), a reaction that should increase the chances of the university to control its destiny. Entrepreneurship, in this case, is a characteristic of the social system that consists of the entire university, its departments, research centres, faculties, schools, where the concept of "enterprise" is emphasized, i.e., desired actions and efforts in the creation and establishment of institutions for which special activities and energy should be invested. The entrepreneurial university is in constant activity and change, which should welcome and solve problems.

2.1. THE CONCEPT OF AN ENTREPRENEURIAL UNIVERSITY

The concept of an entrepreneurial university includes the following activities:
(a) Strengthening of development planning functions;
(b) Expansion of the development periphery: institutions for technology transfer, cooperation with industry, protection of intellectual property, etc.;
(c) Diversification of funding sources;
(d) Stimulating academic entrepreneurship;
(e) Integrating entrepreneurial culture.

2.2. INFRASTRUCTURE SUPPORT FOR ENTREPRENEURSHIP

Within the mentioned activities, entrepreneurial universities pay great attention to animating and motivating employees and students to "crown" the results of their scientific research and innovation work by commercializing the obtained technologies. For these purposes, Technology Transfer Offices, Technology and Innovation Support Centres, Technology Incubators and Science and Technology Parks are established at universities:

- Technology Transfer Offices (TTOs) are usually created within a university in order to manage its intellectual property (IP) assets and the transfer of knowledge and technology to industry. Sometimes, the mandate of TTOs with respect to collaborative research includes any interaction or contractual relation with the private sector. Common names for such offices differ. Some examples include: Technology Licensing Office (TLO), Technology Management Office, Research Contracts and IP Services Office, Technology Transfer Interface, Industry Liaisons Office, IP and Technology Management Office, and Nucleus of Technological Innovation [WIPO-Int].
- Technology and Innovation Support Centres (TISCs) help innovators access patent information, scientific and technical literature, search tools and databases, and make more effective use of these resources to promote innovation, technology transfer, commercialization and utilization of technologies. The WIPO TISCs program currently supports over 80 countries. WIPO supports its member states in establishing and developing TISCs in universities and other institutions in numerous countries around the world [WIPO-Int] [WIPO-Int].
- Science and technology parks (STP) are territories usually affiliated with a university or a research institution, which accommodate and foster the growth of companies based therein through technology transfer and open innovation [WIPO-Int].
- Technology business incubators (TBIs) are organizations that help startup companies and

individual entrepreneurs develop their businesses by providing a range of services, including training, brokering and financing [WIPO-Int].

Here it is necessary to emphasize that adequate innovation infrastructure is defined by the Law on Innovation Activity of Montenegro [MNE-Inn Law, 2020; Article 10 of the Law]:

- A ***startup*** is a newly founded company that is not older than five years and that creates, develops and puts into use innovations with high growth potential on the international market;
- A ***spinoff*** is a newly founded company created as a result of scientific research or technology transfer, by separating it from an existing legal entity, with the aim of commercial exploitation of the results of research or innovation.

Technology transfer requires active participation of researchers' employees at the university. Inventors typically provide technical evaluation of previous patents and publications in their field, assist patent attorneys with writing the patent and responding to detailed examination report objections, and discuss technical aspects with interested companies. In addition, the interpersonal networks of researchers can often be used to kick-start links with industry. There are six reasons why the cooperation of researchers in technology transfer is vital:

1. To generate ideas which provide the basis for the commercial opportunity;
2. To disclose inventions with commercial potential to the technology transfer office (TTO);
3. To assign their rights for the inventions to the university;
4. To assist the TTO in seeking protection (e.g. patent) before publishing the results of the research in academic publications, conference papers, etc.;
5. To find potential licensees, investors and other partners;
6. To support further development of the invention (e.g. as a consultant to a licensee or as a founder of a spin-off).

On these grounds, companies invest in the university research and the researchers. In order to motivate and facilitate researchers to disseminate their research results for the benefit of society, universities and governments can put incentives in place, which will influence their involvement.

A good practice within those activities is the preparation of manuals, that is, instructions on how to carry out technological transfer, that is, to protect and commercialize the intellectual property created as a result of that scientific research and innovation work. They especially stand out as extremely instrumented, easy to use and extremely understandable to a wide range of users, *guides* of universities in the USA. These guides serve as a model for this Guide. That's why the process of technology transfer will be presented, based on the mentioned guidelines in the USA, according to the principle of **Q and A**, questions and answers. Since the set of questions in this manual was derived from reputable documents listed in the list of bibliographic references, it can certainly be expanded by interested readers. If there are such questions, the author of the Guide will be grateful to the readers and users of the Guide, to expand the next version of this document with answers to those questions as well!

Risk Assessment area, become a strong pillar towards health protection of the whole population, foster sustainable food production in Montenegro based on native resources and new technologies. Having mentioned above, Guide for Technology transfer has developed as result of authors within UDG FoodHub - Centre of excellence for digitalization of risk assessment in the field of food safety and accurate certification of authenticity of food within Work package 7 – Sustainability - Formation of stakeholder platforms and networking for transfer of knowledge and technology.

2.3. INTELLECTUAL PROPERTY POLICY AT THE UNIVERSITY

Intellectual property (IP) is an important instrument at the research and development level. It helps assure the ownership over intellectual findings and the capacity to control the use of IP in line with an institution's mission and core values [WIPO, int]. IP is also a powerful business tool to gain position on the market and exclusivity over a new product or process. This makes it an important instrument to attract partners and potentially obtain return on research investment through development collaboration or licensing deals. Understanding how IP serves technology transfer is the first step towards managing your technology transfer processes effectively.

Institutional IP policies are policies put in place by universities or research institutions to address IP issues typically encountered during collaboration with external parties and commercialization of academic research. An institutional IP policy must comply with all relevant national policies and strategies. There will be circumstances in which national laws impose limitations on how individual universities and research institutions can deal with IP rights or share benefits. Subject to those limitations, each institution may regulate the principles of ownership of IP rights through its internal IP policy, employment contracts and other contractual arrangements [WIPO, int].

What is an institutional intellectual property policy?

An institutional IP policy is a formal document which typically deals with [WIPO, int]:
- ownership of and right to use the IP;
- procedures for identification, evaluation, protection and management of IP;
- procedures for cooperation with third parties;
- guidelines on the sharing of profits from successful commercialization;
- mechanisms to ensure respect for third-party IP rights.

An institutional IP policy is usually part of the broader regulatory framework of an institution. As such, it must be coherent and compliant with the other acts or policies put in place, especially those related closely to the scope of the institutional IP policy. This is the case notably for policies regulating:
- a specific type of IP or asset (e.g. copyright, trademark, utility models, software);
- participation of students in research;
- collaboration with industry;
- confidentiality;
- functioning of the institution's Technology Transfer Office (if there is one);
- creation of institutional spin-off companies.

What are the main goals of an institutional IP policy?

Main goals of an institutional IP policy at universities are [WIPO, int]:
- Provide legal certainty.
- Promote scientific research and technological development.
- Encourage researchers to consider the possible opportunities for exploiting an invention so as to increase the potential flow of benefits to society.
- Provide an environment that supports and encourages innovation and development.
- Balance the various conflicting interests of universities, industry and society.
- Ensure compliance with applicable national laws and regulations.

What are the six steps to creating an effective institutional IP policy?

No one model policy can be applied across all institutions or countries, since there are important country-specific institutional differences as well as different levels of absorptive capacity (i.e.

the capacity of local businesses to recognize the value of new external information, assimilate it and apply it to commercial ends). Furthermore, countries and institutions are still experimenting with a mix of different institutional IP policies and practices, gathering evidence on what works and what does not.
However, there are a few steps you can take to ensure that the institutional IP policy you are working on is effective and corresponds to your institution's needs [WIPO, int]:

1. Find inspiration in existing institutional IP policies
Most large universities and research institutions have developed IP policies that are publicly accessible. Browse *WIPO's Database of IP policies* for examples of policies from different institutions across the world, to help you understand how other institutions deal with IP issues.

2. Involve the right people
Various stakeholders contribute to creating and disseminating innovations, inventions and research findings or teaching materials. Each stakeholder has their own interests and expectations which are not always fully aligned. To obtain commitment and endorsement, an institutional IP policy should preferably be drafted together with the main stakeholders.

3. Consider key policy choices
Use *WIPO's IP Policy Writer's Checklist* as a tool for kick-starting the drafting process. The checklist walks you through the preparation, drafting, implementation and monitoring stages of your IP policy project.

4. Draft your institutional IP policy
The *WIPO Intellectual Property Policy Template for Academic and Research Institutions* and its *Guidelines for Customization* can provide great support for drafting a comprehensive IP Policy. Adhering to a template will streamline the writing process and save you time. However, customization to local factors and individual circumstances are crucial in shaping your singular IP Policy.

5. Disseminate and improve your institutional IP policy
Check the *WIPO IP Policy Writer's Checklist* for guidance on how to:
   - communicate and enforce your IP policy;
   - raise awareness on IP and technology transfer issues;
   - revise and update the policy.

6. Develop a national model IP policy for universities
WIPO undertakes a range of activities to support the development of IP policies for universities and research institutions around the world. WIPO projects typically involve assessment missions, recommendations with best practices, development of a national model IP policy for universities, and practical assistance to selected universities and research institutions in drafting tailored IP policies.

Management of Academic Assets for Technology Transfer

Academic assets are defined as tangible or intangible resources that may be owned or controlled by an institution, managed and used in collaboration with another party to create public and/or economic value. There is a wide range of classifications of academic assets, but in a more general sense they can be divided into intellectual assets and non-intellectual assets [WIPO-int].

Intellectual assets:
- Intellectual property (created, identifiable and protectable by IP laws, such as patents, trademarks, industrial design, copyrights, etc.);
- Knowledge assets (protectable and identifiable by contract, commercial or competition law - such as trade secrets, knowledge, know how, expertise, etc.).

Non-intellectual assets:
- Collections (libraries, etc.);
- Research infrastructure & capacity (laboratories, equipment and skilled people, etc.);
- Financial assets (spin-off companies, private fund managers, etc.);
- Operational assets (TTOs, KTOs, clinical trial officers, etc.);
- Strategic assets (reputation, access to patients, entrepreneurial culture, etc.).

Mapping of Intellectual Assets

Universities and research institutions often own or control different types of "academic assets" that are potentially very useful and powerful resources for initiating collaborations with other research institutions, attracting industry partners or providing useful services to public sector and society. Often these institutions are not fully aware of the existence and potential value of the assets under their control.

WIPO has created a simple tool for mapping academic assets, Academic Intellectual Assets Map, intellectual and non-intellectual, that provides an overview of most conceivable assets that an academic institution may have, as well an overview of a variety of methods, actions and pathways for utilization of academic assets. The tool shows that strategic use of even non-intellectual assets can lead to very dynamic scientific or business collaborations that turn new inventions and IP into innovative products and services in the marketplace [WIPO-int].

Academic Intellectual Assets Map

Intellectual Property Rights (IPR) Management in Academic Institutions: IP is not an asset by virtue of its mere existence, as the number of patents is not a complete measure of an organization's innovation potential. Strategic IPR management by qualified professionals is needed to enable the protected invention to generate income and other benefits at the end of the technology transfer and IP commercialization process.

The management of IPR is not a linear process, but it may be considered as a set of strategic processes that includes the following steps [WIPO-int]:
- Identifying potential assets created or acquired by the organization – invention, new technology, formula, code;
- Evaluation of the technical, legal and market advantages of the potential asset;
- Decision making on the available forms of protection , including registered protection (e.g. patents, trademarks, registered designs) and/or unregistered protection (e.g. trade secrets, copyright, circuit layout, database rights);
- Determining marketing and technology transfer strategy - whether IP assets will be used internally, commercialized by the organization - assignment or licensing, transferred to a

third party or spin-off, or offered to the public for free;
- Identification of the best partners - in accordance with the business goal and socially responsible policy of the organization.

IPR management in academic institutions includes not only the actions necessary to transfer technology from inventors to public and private users, but also the necessary steps before the actual transfer (research management or "technology intelligence") and afterwards (technology portfolio management, i.e. auditing, patent prosecution, quality assurance, contract management after signing, human resource management, etc.). As such, IPR management is one of the important prerequisites for a successful technology transfer and sustainability of the impact of research outcomes on the society.

The legal framework for IPR management policies in academic institutions has four levels: international, national, institutional and professional associations-related levels. Moreover, due to complexity of IPR management process in academic institutions, clear IP management principles and guidelines are necessary to ensure the most effective outcome.

3. TECHNOLOGY TRANSFER PROCESS

What is technology transfer?

"TECHNOLOGY TRANSFER (TT) is a collaborative process that allows scientific findings, knowledge and intellectual property to flow from creators, such as universities and research institutions, to public and private users. Its goal is to transform inventions and scientific outcomes into new products and services that benefit society. Technology transfer is closely related to knowledge transfer" [WIPO-int].

TECHNOLOGY TRANSFER is the process of transferring scientific findings from one organization to another to for the purpose of further development and commercialization [WIPO, 2022].

In Montenegro, the definition of technological transfer is given in the Law on Innovation Activities (so-called Innovation Law): **Technology transfer is the process of knowledge and technology transfer that takes place between scientific institutions, scientific institutions and the economy, as well as between economic entities on the domestic or international market, in order to enable further development of products, services, processes and technologies, protection of intellectual property and support for their commercialization** [MNE-Inn Law, 2020; Article 10 of the Law].

How is technology transferred?

Technology transfer supports the life cycle of technology, from inception to market diffusion and commercialization. Technology is typically transferred through a license agreement in which TTO (Technology Transfer Office at University) grants its rights in the defined technology to a third party (the licensee) for a pre-defined period of years. This license agreement is sometimes limited to a particular field of use and/or region of the world. The licensee may be an established company or a new business start-up. Licenses include terms that require the licensee to meet certain performance requirements and to make financial payments to TTO. These payments are shared with the inventors and are used to provide support for further research and development (R&D) and participation in the technology transfer process at the university (the distribution of profits from technology transfer is the subject of a separate section of this Guide).

In Montenegro, technology transfer is supported from public funds: "*the innovation activity program is part of the innovation policy, which defines measures for the improvement of the commercialization of innovations, the creation of special conditions for the development of advanced technologies, the development of innovation infrastructure, capacity building for innovation activity, international cooperation in innovation and other activities that are carried out in cooperation with the subjects of the national innovation system*" [MNE-Inn Law, 2020; Article 10 of the Law].

The Innovation law also defines innovation infrastructure that supports technology transfer: "*innovation infrastructure includes facilities, technical-technological equipment, software and a knowledge network to support the implementation of innovation activities, which the respective entity provides with the aim of spreading knowledge and awareness of innovations, supporting the creation and strengthening of innovative economic entities, valorisation of R&D results, improvement of innovative capacities of the economy and universities, internationalization of business and scientific activities, cooperation between the economic, scientific, academic and public sectors and strengthening the scientific base of society*" [MNE-Inn Law, 2020; Article 10 of the Law].

What is the Bayh-Dole Act?

The U.S. BAYH-DOLE ACT of 1980 allows universities and other non-profit institutions to obtain title to inventions developed from federally funded R&D provided certain obligations are met. These obligations include trying to protect (when appropriate) and commercialize the discoveries, submitting progress reports to the funding agency, giving preference to small businesses that demonstrate sufficient capability, and sharing any resulting revenues with the inventors. The Bayh-Dole Act is credited with stimulating interest in technology transfer activities and generating increased R&D, commercialization, educational opportunities, and economic development in the United States.

The U.S. The BAYH-DOLE ACT has had a great impact on the expansion of entrepreneurship in US universities, the development of new technologies, the increase in the number of patents protected by universities and, consequently, great economic effects and commercial success of both universities and researchers at universities themselves. Furthermore, such an effect of legal regulation of inventions at universities in the USA has expanded and become a recommended good practice for the protection and commercialization of intellectual property at universities around the world.

In Montenegro, the relationship between institutions that finance scientific research and innovation projects from the budget, that is, from public funds (ministries responsible for science and technological development and innovation activities; innovation fund, etc.) and organizations that implement these projects (universities, institutes, companies, non-governmental organizations) is regulated by their mutual contracts. Within those contracts, the method of disposal of the intellectual property created by the realization of the projects is also defined. The bottom line is that the institutions that finance scientific research and innovation projects from public sources transfer the right to use the intellectual property created by the implementation of the projects to the project implementers.

What is intellectual property?

INTELLECTUAL PROPERTY (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. IP is legally protected through patents, copyrights and trademarks, which enable people to earn recognition or financial benefit from what they invent or create.
In Montenegro, intellectual property rights are defined by the Law ON THE APPLICATION OF REGULATIONS GOVERNING THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS [MNE-IP Law, 2005, Article 4]: "Intellectual property rights are copyright and related rights, trademark, geographical indications of origin, design, patent and topography of integrated circuits".

What is the Technology Transfer Office (TTO) and what does it do?

TTO is an organizational unit within the University. It includes technology managers who have strong technical backgrounds and who are highly experienced in IP management, licensing, and business development. Aligned with one or more university sectors, departments, and mission areas, each technology manager works closely with management and technical staff as a trusted partner to ensure that university IP objectives are met in accordance with laws. Furthermore, TTO works to ensure that any specific IP-related priorities of particular sectors and departments are addressed with regard to the technology transfer process. TTO provides guidance on transferring university developed technologies and other IP to further production or commercial development and distribution.
NOTE 1: Throughout this Guide, the term "inventor" includes individuals listed on patents or patent applications as well as contributors who have created IP that is not patented. Both inventor

and innovator are defined in the Law on Innovation Activity of Montenegro:

- An inventor is a natural person who independently performs innovation activities and is engaged in research and creation of a conceptual solution, a new or significantly improved product, service or technology, prototype, new methods or other forms of intellectual property that can be protected at the national or international level;
- An innovator is a natural person who independently carries out innovation activities in such a way as to use the results of his research and creation of a conceptual solution, a new or significantly improved product, service or technology, prototype, new methods or other forms of intellectual property that can be protected at the national or international level, for the purpose of commercialization [MNE-Inn Law, 2020; Article 10 of the Law].

NOTE 2: In this guide, KTT is treated as an organizational unit that is established and exists at the University. The University of Donja Gorica (UDG) has not yet established a KTT, but this Guide should be an incentive for its establishment!

How do I work with TTO?

You are encouraged to contact the TTO at the University immediately after starting your R&D activities. The staff at TTO will work with you to make you aware of and advise you of the options that will best leverage the commercial potential of your (potentially developed) technology. The technology experts in TTO are trained to assist you with questions related to marketability, patenting and other protection methods, new business start-up considerations, university IP policies and procedures, etc.

How long does the technology transfer process take?

Any interested inventor and/or innovator, researcher at the university, must show great patience here: the process of protecting the technology and finding the right licensing partner may take months or even years to complete. The length of time will depend on the development stage of the technology, the market for the technology, competing technologies, the amount of work needed to bring a new concept to market-ready status, and the resources and willingness of the licensees and the inventors.

What are the steps of the process of technology transfer?

The process of technology transfer begins with research activities at the University and potentially ends with the distribution of profits from commercialized intellectual property.

That process consists of the following nine activities:

1. Research and Development (R&D)
   Observations and experiments during R&D activities often lead to discoveries and the creation of IP. Often, multiple inventors will have contributed to the IP.

2. IP Disclosure
   The written notice of IP creation to TTO that begins the formal technology transfer process. An IP Disclosure remains a confidential document and should fully

document your IP so that the options for commercialization can be evaluated and pursued. This activity can be preceded by an early contact with TTO in which you discuss your IP with a technology expert, who provides guidance with respect to the disclosure, evaluation, and protection processes (in that case, an activity named "Invention Pre-Disclosure" is added).

3. Assessment
   The period in which your technology manager from TTO reviews the IP Disclosure, conducts a patentability review, and analyses the market and competitive technologies to determine the IP's commercialization potential. This evaluation process will guide the strategy on whether to focus on licensing to an existing company or to a new business start-up.

4. IP Protection
   Safeguarding IP with protection through patents and copyrights is crucial to fostering innovation because without protection, inventors may be stymied in continuing to develop their ideas and commercialization partners may be reluctant to invest capital to bring IP to market in a good or service. Patent protection, a common legal protection method, begins with the filing of a patent application with the **Directorate for Intellectual Property at the Ministry of Economy of Montenegro (DIP)** and, when applicable, with foreign patent offices. Once a patent application has been filed, it typically will require several years and a certain amount of EUR to obtain issued national (Montenegro) and foreign patents. Other University protection methods include copyright, trademark, tangible R&D property (e.g., biological material), and contractual use restrictions (e.g., for databases and materials). The TTO is responsible for determining the most appropriate IP protection strategy.

5. Marketing of IP
   The TTO identifies candidate companies that have the expertise, resources, and business networks to bring the technology to market. This may involve marketing to an existing company or a start-up. Your active involvement can dramatically help facilitate the marketing process.

6. Selecting a Licensees
   TTO is committed to selecting licensees who have the greatest potential to commercialize the invention/technology. After companies are selected, the technology manager will work with those potential licensees to develop the appropriate financial and diligence terms to fully commercialize the technology. In some cases, University IP may be licensed to University start-ups.

7. Licensing
   Once a licensee has been identified, an agreement has been negotiated, and the TTO has considered the potential licensee, TTO will execute a license agreement. A license agreement is a contract between University and a third party in which University's rights to a technology are licensed for fair consideration (e.g., an up-front fee, milestone payments, royalties) and other benefits. License agreements are used with both new start-up businesses and established companies. An option agreement is sometimes used to enable a third party to evaluate the technology and its market potential for a limited time before deciding about licensing.

8. Commercialization
   The licensee continues the advancement of the technology and makes other business investments to develop the product or service. This step may entail further development, regulatory approvals, sales and marketing support, training, and other activities.

9. Revenue
   Revenues received by University from licenses are shared among University, inventors, and,

if applicable, partnering institutions to fund additional R&D and education and to encourage further participation in the technology transfer process.

3.1. RESEARCH AND DEVELOPMENT

Will I be able to publish the results of my R&D and still protect the commercial value of any related IP?

According to the document "CONDITIONS AND CRITERIA FOR PROMOTION TO ACADEMIC TITLES", issued by the Council for Higher Education on session held on April 16th 2019, the key activity of researchers and lecturers at universities and institutes in Montenegro is the publication of scientific papers, primarily in scientific journals from the SCI list: "Person being promoted into academic title in related scientific fields shall meet the following qualitative criterion: Scientific and research results of the candidate are published in scientific journals from citation lists or bases of scientific papers SCI/SCIE/SSCI/A&HCI (categories Q1, Q2, Q3 and Q4, Annex 1)" [MNE-HE Council, 2019; Article 6]. Patenting is eventually recognized as an equivalent for bibliography evaluation: "Exceptionally, when evaluating bibliographic references for candidates being promoted to academic titles who do not meet the requirements concerning criteria for papers from categories Q1, Q2, Q3 and Q4 (listed in Article 7), it is possible to apply one of the following equivalences: 1) M1: Author's scientific monograph published by a renowned international publisher of scientific literature can be equivalent to one paper in a renowned journal (Q1 category); 2) M2: A chapter in a monograph published by a renowned international publisher of scientific literature can be equivalent to a single paper in a renowned journal (Q3 category); 3) R1: Editorial board in a Q1 journal may be equivalent to working in a Q1 journal, and editorial in a Q2 journal may be equivalent to working in a Q2 journal; **4) I1: International patent (EU patents, US patents) can be equivalent to one paper in a journal from Q3 category;** 5) A paper published in a journal from a list determined by the Ministry of Education may be equivalent to one paper in a Q4 category journal" [MNE-HE Council, 2019; Article 12].

That's why this question is logical because researchers and lecturers in Montenegro have to publish papers! Of course, the answer is "**YES**", but **only after the patent application is filed in patent office in Montenegro**. Any form of publication of research results: presentation, lecture, poster, abstract, website description, R&D proposal submission, dissertation, publication, or other public presentation including the invention; at the moment of publication, it becomes the "state of the art" that is examined in the patent application, and regardless of whether the author of the patent is the one who publishes the result of the research, the application is rejected because it is already known "state of the art".

Note: There are significant differences between the United States and other countries as to how early publication affects a potential patent. Once publicly disclosed (published or presented in any form), an invention may have restricted or minimal potential for patent protection outside of the United States.

May I use material or IP from third parties in my R&D?

Generally, yes, as long as the University has obtained the appropriate authorizations from the third parties. This may be done in a variety of ways but typically involves University third-party license agreements, nondisclosure agreements (NDAs), and/or material transfer agreements (MTAs). For sponsored R&D, the use of third-party IP or materials may be restricted and/or subject to the sponsor's preapproval. In all cases, use of third-party IP or materials should follow the terms of any applicable third-party agreements or licenses. This includes the use of open-source software, which may be available for use at no charge but may impose certain restrictions and

obligations on its use, as specified in an open-source license. Furthermore, it is important to carefully document the use of third-party IP or materials to allow for the determination of any impact on the ownership and license rights of your subsequent R&D results.

Will I be able to share materials, R&D tools, or IP with others to further their R&D?

It depends on several factors, including authorization from your management chain, approval through the University's public release process, any sponsor requirements and sensitivities, and IP protection considerations.

What rights does an R&D sponsor have to any discoveries or IP associated with my R&D?

For R&D and innovation projects funded by the Ministry of Science or Innovation Fund, the rights of those institutions are defined by laws and acts on their establishment and functioning. In the contracts on the financing of scientific research and innovation projects, special articles define that the University retains ownership of IP generated from the R&D and has the ability to commercialize the IP subject to certain conditions and requirements. The Ministry and the Innovation Fund retain a free, nonexclusive license to use the IP for government purposes. For R&D funded by industry or another non-governmental sponsor, the University typically negotiates to retain ownership of IP that it generates from the R&D as well as nonexclusive rights to practice the IP for internal R&D and national purposes. The industry sponsor will usually seek exclusive rights to exploit the IP for commercial purposes and may seek to impose obligations on the University with regard to reporting and protecting any generated IP and publishing R&D results.

What about consulting?

When University staff members enter into consulting agreements, they are deemed to be acting outside the scope of their employment. Prior to entering into such agreements, University staff members must obtain approval from their management chain to engage in this form of outside activity. Furthermore, while personal consulting agreements are reviewed by University as part of the approval process, they are not negotiated by University on the staff member's behalf. University staff are expected to ensure that the terms of the consulting arrangement are consistent with University policies, including those related to IP ownership, employment responsibilities, and use of University IP and resources.

3.2. IP DISCLOSURE

What is an IP Disclosure?

An *Intellectual Property (IP) Disclosure* is a written description of your invention or development, which arose as a result of your research at the University. University staff should provide in the IP Disclosure a list of all inventors (or authors), information about any funding used to develop the IP, a full description of the IP, and details of any prior or planned public disclosures or uses of the IP. Any additional relevant material may be included in (or as an attachment to) the IP Disclosure. IP Disclosures are internal University documentation and remain confidential to University. They do not, in and of themselves, protect the underlying IP.

After the IP Disclosure has been received and processed, TTO will set up an initial meeting between an assigned technology manager and one or more of the University inventors listed on the IP Disclosure to discuss and assess the technical details, any mission area or sponsor sensitivities, plans for further development, possible commercial applications, and steps that may be required to appropriately protect the IP.

As stated earlier, this activity can be preceded by an early contact with TTO in which you discuss your IP with a technology expert, who provides guidance with respect to the disclosure, evaluation, and protection processes (in that case, an activity named "Invention Pre-Disclosure" is added).

How do I know if my discovery is an invention?

You are encouraged to submit an IP Disclosure for all inventions and developments that you feel may solve a significant problem and/or have significant value. If you are in doubt, contact TTO to discuss the invention and strategies for protection and commercialization.

Should classified IP be submitted in an IP Disclosure?

Yes, IP that is classified should still be submitted. For all investigations that are conducted as a certain type of secret, especially in cases of contracts with the military, care must be taken to keep the secret and not publish the results of the investigation. That is why steps in disclosure should be taken to appropriately limit the classified details of the IP that are provided in the IP Disclosure form.

What is University's policy on ownership of IP?

The University must have an adequate IP policy in the form of a document with an elaborated procedure for dealing with IP (e.g. in the form of this Guide), regarding its ownership of IP developed by University staff while employed by the University. The University owns and manages IP that is made, conceived, first reduced to practice (e.g., putting a concept into practice or applying a concept), created, or authored by University staff members (solely or jointly with others) while employed by the University that meets at least one of the following criteria:

1. The IP is funded in whole or in part by the University or a sponsor of the University;
2. The IP involves the use of University facilities, personnel, equipment, materials, or University proprietary information;
3. The IP is prepared within the scope of the staff member's employment;
4. The IP is related to University programs or activities.

For course materials, such as lectures and related notes, syllabi, presentations, and textbooks, IP ownership belongs to the University staff member(s) who prepared the materials (subject to third-party interests) as long as none of the first three criteria apply to the development of the course materials and the course materials do not include information specific to a University program or activity. Questions regarding University's IP ownership policies should be directed to the University Legal department.

Does University enforce its IP?

The University works to protect its IP against infringement by others who have not secured a license from the University. Such actions are rare, but TTO welcomes the input of inventors when they are aware of infringement by others.

Should I list researchers from other institutions on my IP Disclosure?

All contributors to the ideas leading to a discovery should be noted in your IP Disclosure, even if they are not University employees. TTO, along with University Legal department, will determine the rights of such persons and their respective institutions and, if appropriate, negotiate inter-institutional agreements to address how jointly developed IP will be managed with regard to protection and commercialization. It is prudent to discuss with TTO all working relationships (preferably before they begin) so that the implications for any subsequent IP can be understood better.

How does TTO assess IP Disclosures?

Technology experts in TTO examine each IP Disclosure to review and evaluate the IP on the basis of several criteria. These include the problem to be solved, magnitude of the proposed solution, size of the unmet need and potential market, potential customers and market segments, competitive landscape, capital requirements, milestones to move the technology to market, and companies that might commercially license the technology. TTO experts also carefully considers pre-existing rights associated with the IP and also investigates any actual or potential sponsor or mission area sensitivities.

How does TTO decide whether to commercialize with a traditional or an "open-source" license for software?

Generally, TTO supports University software developers who desire to make software open source provided that University retains the right to distribute the program freely, open sourcing is consistent with obligations to sponsors, and the developer's management chain and mission area support the decision. As a first step, developers should seek authorization from their management chain at University.

3.3. ASSESSMENT

What is IP valuation?

IP valuation is the process of identifying and measuring potential benefits and risks of an intangible asset. IP valuation is important for business planning, licensing, acquisitions, mergers, investments, joint ventures and loans. Valuation methodologies are important, because funding institutions are often willing to consider investment in research and innovative technologies, but lack the methodology with which to assess the value of IP assets.

IP valuation is considered as one of the most complex issues in the process of IP commercialization as it is very volatile and subjective. IP valuation, at least in its quantitative approach, appears as a scientific calculation. However, it is only an estimation depending on the experience of the valuator in the particular area and his or her ability to make technical, market and IP projections in the future (except in litigation where valuation of the lost benefit would be done based on past events and existing market data). In addition, the value of an intangible asset further depends on the context, thus the same asset can simultaneously have different values in different contexts.

Valuation process can be challenging for multiple reasons, starting with the fact that universities and R&D institutions often deal with early-stage technologies, very far from market penetration and use, which makes any projection of the future benefit extremely risky – at this stage it is very difficult to define potential fields of use and thus to identify a suitable market in which technology would be exploited. The other impeding element is the lack of IP professionals with appropriate skills to conduct IP valuation.

Will University honour specific preferences of inventors with regard to technology transfer strategies?

TTO will work with you to develop the appropriate technology transfer strategy for the IP. The strategy will be selected with the best interests of the University in mind. Some technologies lend themselves to nonexclusive licensing (licensing to multiple parties), while others will only reach the commercial marketplace, and therefore the public, if they are licensed on an exclusi-

ve basis. Some technologies are suitable only for transition to another party at the direction of a sponsor. Although University will consider the preferences of University staff with regard to technology transfer, any final decision will be determined by the University, in consultation with TTO, on the basis of an objective assessment of approaches that will best protect University's interests while producing the greatest impact.

3.4. IP PROTECTION

What is a patent?

In Montenegro, a PATENT is an exclusive right granted by the state for an invention that is new, has an inventive level and is industrially applicable. A patent is a form of intellectual property that can protect an invention that represents a new solution to a specific technical problem, while patent rights are recognized for those inventions related to a specific product, application or procedure.

A patent does not necessarily provide the holder any affirmative right to practice a technology since it may fall under a broader patent owned by others. Instead, it provides the right to exclude others from practicing the invention. Patent claims are the legal definition of an inventor's protectable invention. Patents may provide protection of ideas and concepts that are novel, not obvious, and constitute patent-eligible subject matter. Since the scope of protection may extend to base ideas and concepts, i.e., beyond a particular implementation of an idea or concept, patents offer a potentially broad scope of protection. As a result, patents are generally considered a strong form of IP protection and are often highly valued by industry for commercial purposes and as an indication of technical innovation.

Articles of the Law on Patents of Montenegro that define what is a PATENT and the Novelty, Inventive level and Industrial applicability of the Invention [MNE-Patent Law, 2005]:

> *Article 5*
> *A patent is a right that is recognized for any invention from any field of technology that:*
> 1) *is new;*
> 2) *has an inventive level, and*
> 3) *is industrially applicable.*
>
> *The novelty of the invention*
> *Article 8*
> 4) *An invention is new if it is not included in the state of the art.*
> 5) *The state of the art, in terms of this law, consists of:*
>   I. *Everything that is available to the public before the date of filing the patent application, by written or oral description, use or in any other way, and*
>   II. *The content of all applications for inventions that have effect in Montenegro, as submitted, which have an earlier date of submission than the date referred to in point 1 of this paragraph, and which were published on that date or later, in the manner provided by this law.*
>   III. *The provisions of para. 1 and 2 of this article do not exclude the possibility of patent protection of substances or compositions contained in the state of the art that are used in surgical or diagnostic procedures or in treatment procedures, provided that their application in those procedures is not contained in the state of the art.*
>   IV. *The provisions of para. 1 and 2 of this article do not exclude the possibility of patent protection of substances or compositions from paragraph 3 of this article*

that are used in special surgical, diagnostic or therapeutic procedures, provided that such use is not contained in the state of the art.

Inventive level of the invention
Article 10

1) *An invention has an inventive level if, for an expert in the relevant field, it does not derive, in an obvious way, from the state of the art.*
2) *When examining whether the invention has an inventive level, the content of the application from Article 8 paragraph 2 point 2 of this law is not taken into account.*

Industrial applicability
Article 11
An invention is industrially applicable if the object of the invention can be produced or used in any branch of industry and agriculture.

What type of subject matter can be patented?

Article of the *Law on Patents* of Montenegro that define what is the subject of the invention protected by a patent in Montenegro [MNE-Patent Law, 2005]:

Article 5

(1) *A patent is a right that is recognized for any invention from any field of technology that:*
    1) *is new;*
    2) *has an inventive level, and*
    3) *is industrially applicable.*
(2) *The subject of an invention protected by a patent can be a product (such as a device, substance, composition) or a process.*
(3) *The subject matter of an invention protected by a patent may also refer to:*
    a. *a product consisting of biological material or containing biological material;*
    b. *procedure by which biological material was produced, processed or used;*
    c. *biological material that was isolated from the natural environment or was produced by a technical process, although it previously existed in nature.*
(4) *Biological material, in the sense of this law, is material that contains genetic information and is capable of reproducing itself or being reproduced in a biological system (eg microorganism, plant or animal cell culture, gene sequence).*
(5) *The following are not considered to be inventions, in the sense of this law, in particular:*
    1) *discoveries, scientific theories and mathematical methods;*
    2) *aesthetic creations;*
    3) *plans, rules and procedures for performing intellectual activities, for playing games or for performing tasks;*
    4) *computer programs;*
    5) *display of information.*
(6) *Objects or activities from paragraph 5 of this article are excluded from protection only to the extent that the patent application or patent relates to that object or activity, as such.*

Which institution is responsible for the protection of IP in Montenegro?

The Office for Intellectual Property is the fundamental national institution for the protection of intellectual property in Montenegro. The Office for Intellectual Property of Montenegro was founded on May 11, 2007 as a special body in the state administration system, and since 2017

it has been functioning as an independent body within the Ministry of Economic Development and Tourism of Montenegro as Directorate for Intellectual Property. The Ministry of Economic Development and Tourism of Montenegro is responsible for the preparation of regulations in the field of intellectual property.
It is important to mention three more institutions important for the protection of patents: the World Intellectual Property Organization (WIPO), the U.S. Patent and Trademark Office (USPTO) and the European Patent Office (EPO):

- The USPTO is a federal agency, organized under the U.S. Department of Commerce, that administers patents on behalf of the government. The USPTO employs patent examiners skilled in all technical fields in order to appraise patent applications. It also issues federal trademark registrations.
- The European Patent Office (EPO) examines European patent applications, enabling inventors, researchers and companies from around the world to obtain protection for their inventions in up to 44 countries through a centralised and uniform procedure that requires just one application. The European Patent Office (EPO) was set up in 1973. From 16 signatory states of the European Patent Convention in 1973, the Organisation has now grown to 39-member states, including all 27 EU member states plus countries such as Norway, Switzerland and Turkey. The EPO is the executive arm of the European Patent Organisation, an international organisation with 39-member states. The EPO's activities and budget are overseen by the Organisation's Administrative Council, which consists of representatives of the member states.
- The World Intellectual Property Organization (WIPO) is the global forum for intellectual property (IP) services, policy, information and cooperation. We are a self-funding agency of the United Nations, with 193 member states. The World Intellectual Property Organization (WIPO;) is one of the 15 specialized agencies of the United Nations (UN). WIPO mission is to lead the development of a balanced and effective international IP system that enables innovation and creativity for the benefit of all. WIPO mandate, governing bodies and procedures are set out in the WIPO Convention, which established WIPO in 1967. Montenegro became a member of the World Intellectual Property Organization (WIPO) in 2006:
  - Cooperation on the implementation of contracts/agreements on the international registration of certain industrial property rights, namely: the Agreement on Cooperation in the Field of Patents, the Madrid Agreement on the International Registration of Trademarks, the Hague Agreement on the International Registration of Industrial Designs and the Lisbon Agreement on the International Registration of Indications of Geographical Origin;
  - Participation in annual meetings of WIPO's administrative bodies: General Assembly and Assembly of Unions of Member States of individual Agreements;
  - Participation in the regular sessions of the WIPO Standing Committees;
  - Participation in diplomatic conferences;
  - Participation in inter-regional and international events organized by WIPO;
  - Organizing and holding national and regional seminars, workshops and conferences;
  - Cooperation with the WIPO Academy (attending courses organized by the WIPO Academy);
  - Expert support in the field of legislation;
  - Expert support in the field of drafting strategic documents in the field of intellectual property;
  - Expert support on improving the information infrastructure

What is the definition of an inventor on a patent and who determines this?

In the text of the Law on Patents of Montenegro, there is no specified definition of inventors [MNE-Patent Law, 2005].

In the European Patent Convention (EPC) and its case law, no explicit, accurate definition of who exactly is an inventor is provided. The definition may slightly vary from one European country to another. Inventorship is generally not considered to be a patentability criterion under European patent law.

Under U.S. law, a patent inventor is a person who takes part in the conception of the ideas represented by the claims of a patent. A person who merely provides routine assistance in implementing the invention, but does not contribute toward the conception of the novel ideas, is not considered to be an inventor for patent purposes. Ultimately, determining inventorship is a legal issue that may require review and determination by University Legal department. University inventors may be required to execute assignment documents that formalize University's ownership of the IP.

Who is responsible for patenting?

Patent filling decisions are made by TTO (in consultation with University Legal department) in view of several inputs, including market research, patentability evaluations, mission area and sponsor sensitivities, feedback from inventors, and budget constraints. University Legal department oversees the preparation and management of patent applications and issued patents in consultation with TTO. University Legal department will typically engage outside patent counsel to prepare and prosecute U.S. nonprovisional and international patent applications on University's behalf. Inventors work with outside patent counsel in drafting patent applications and responses to worldwide patent offices. TTO ultimately makes the final decision whether to file a patent application or seek another form of protection.

Articles of the Law on Patents of Montenegro that define who are the subjects of protection in Montenegro [MNE-Patent Law, 2005]:

> *Subjects of protection*
> *Article 12*
> (1) *The right to acquire and protect a patent belongs to the inventor or his legal successor, that is, in the cases provided for by this law, the employer or his legal successor.*
> (2) *If several inventors came up with an invention through joint work, the right to protection belongs to all inventors.*
> (3) *A person who provided technical assistance to the inventor is not considered an inventor.*
>
> *Inventor's rights*
> *Article 13*
> (1) *The inventor has the right to be mentioned in that capacity in the patent application, files, registers, documents and publications about his invention in the manner determined by this law.*
> (2) *The rights of the inventor who created the invention in the employment relationship and the rights of the organization in which the invention was created are determined by this law, general acts and the contract between the employer and the employee, or their representatives.*

Why does University protect some IP through patenting?

Patent protection is often a requirement of a potential commercialization partner (licensee) because it can protect the commercial partner's often sizable investment, which is required to bring the technology to market. Due to their expense and the length of time required to obtain a patent, patent applications are not possible for all University inventions. TTO carefully reviews the commercial potential of an invention before investing in the patent process. However, because the need to commence a patent filing usually precedes finding a licensee, TTO looks for creative and cost-effective ways to seek early protections for as many promising inventions as possible.

What is the patenting process?

Articles of the Law on Patents of Montenegro that define the initiation of the procedure for the recognition of a patent in Montenegro [MNE-Patent Law, 2005]:

Article 21

(1) *The procedure for granting a patent is initiated by submitting a patent application to the competent authority.*
(2) *The patent application is submitted in the Montenegrin language.*
(3) *The patent application may be submitted in a foreign language, accompanied by its translation into the Montenegrin language.*
(4) *The patent application shall be submitted in writing, directly or by mail.*
(5) *A patent application requesting protection of an invention abroad is submitted in accordance with this law and confirmed international agreements.*
(6) *Legal protection of inventions in Montenegro is achieved through a patent application filed abroad, if it is in accordance with confirmed international agreements.*
(7) *The application referred to in paragraph 6 of this article has the same legal effect as a patent application filed in Montenegro, unless otherwise determined by the relevant international agreements.*

Content of the patent application
Article 23

(1) *The patent application must contain:*
    1) *request for patent recognition;*
    2) *description of the invention;*
    3) *one or more requests for patent protection of the invention (hereinafter: patent requests);*
    4) *the draft to which the description and requirements refer, in the appropriate case;*
    5) *abstract.*
(2) *The method of submission and attachments to the patent application, the method of compiling individual parts of the patent application, as well as the data of importance for the deposit of biological material from Article 25 paragraph 2 of this law shall be regulated in more detail by the regulation of the Ministry.*

The procedure for patent protection of an invention is given according to the presentation "INTELLECTUAL PROPERTY - PATENT PROTECTION OF INVENTIONS IN MONTENEGRO" [Koprivica Mladen, 2019]:

1. Initiation of patent protection of an invention:

- applying to the Ministry of Economy of Montenegro
- submission in writing directly or by post
- submission in the language in official use
- indication that patent recognition is sought
- data on the applicant
- description of the invention and mention of at least one patent claim, even if the description and patent claim(s) do not meet the prescribed conditions.
  Right of Priority: from the date determined as the filing date of the patent application, the applicant has the right of priority over any other applicant who applies for the same invention later.

2. Formal examination

Regulatory compliance:

- whether the fee has been paid
- whether a translation of the patent application into the Montenegrin language was submitted, if the patent application was submitted in a foreign language
- whether a proper power of attorney has been submitted
- whether the inventor is indicated
- whether the application contains all the prescribed parts and whether they meet the prescribed conditions in terms of orderliness
- whether the request for the right of priority meets the prescribed conditions
  If the application does not meet the requirements:
- The Ministry invites the applicant to remedy the deficiencies within 60 to 90 days
- If the applicant does not remove the deficiencies, the Office will reject the patent application

3. Examining the conditions for granting a patent - It is determined whether the subject of the patent application:
- belongs to a group of inventions that are not considered patentable
- belongs to a group of inventions that can be unequivocally established as not being industrially applicable
  Examining the conditions for patent recognition:
- A patent application that meets the conditions for recognition is published in the official gazette
- A patent application that does not meet the conditions for recognition is rejected - the Ministry decides on the rejection of the patent (before making the decision, it informs the applicant of the reasons why the patent cannot be recognized and gives him 2 months to explain the reasons and submit amended patent claims).

If he does not submit a statement, the Ministry issues a decision on refusal.

4. Publication of the patent application
- A patent application that meets all the prescribed conditions is published in the official gazette as soon as possible after the expiry of 18 months from the date of submission of the application, i.e. the date of the requested right of priority, which makes it available to the public
- At the request of the applicant, it can be done earlier, but not before the expiry of the period of three months from the date of submission of the application
- The patent application is published in the Montenegrin Gazette of Intellectual Property (bibliographic data, abstract, drawing...)
-

5. Patent recognition
- Decision on patent recognition and entry of data on the recognized patent in the Patent Register
- Date of publication of patent application is equal to date of patent recognition
- Information about a recognized patent is published in the official gazette at the same time as information from the patent application
- The patent holder is issued a patent document and a patent file
  A patent is created by registration in the patent register, and its validity is from the date of submission of the application.
  Proving patentability gives a stronger legal meaning to the regulation of the patent system in Montenegro:
- By the end of the ninth year of patent validity, the patent holder is obliged to provide written evidence that the invention protected by the patent has been substantially examined and meets the conditions for recognition
- Substantial examination of the patent application is carried out by a state or interstate office in accordance with the Agreement on Cooperation in the Field of Patents, as well as by ano-

ther office, with which the Office signed a cooperation agreement at the time of submission of proof of patentability
- If the patent holder does not submit proof of patentability, the patent ceases to be valid on the day of the tenth year of its duration.

6. Duration and termination of rights
- The patent is valid for 20 years from the date of application, provided that the annual fees for its maintenance are regularly paid
- At the end of 20 years the patent becomes a public good available to everyone!
- The patent ceases to be valid:
  - if the patent holder fails to pay the prescribed fee for maintaining the right
  - submits to the Office a written statement renouncing the patent
  - on the date of death of a natural person, i.e. the date of termination of the legal entity that is the patent holder

7. Exclusive rights
The inventor agrees to disclose to the society the details of his invention, in order to enable technological progress, in exchange for the right of exclusive disposal for a certain period
Patent is the right to ban!
Without the consent of the patent holder, any other person is prohibited from:
- If the subject of the patent is a product:
  Produce, offer for sale, use, put into circulation, export or import and store for these purposes a product that is made according to a protected invention.
- If the subject of the patent is a process:
  Apply a process that is the subject of a protected invention or offer its application offer for sale, sell, use, export or import and store for these purposes a product that is directly obtained by a process that is the subject of a protected invention.

8. Cancellation of a recognized patent
The procedure is initiated by the submission of a proposal by the interested legal and natural person and the state prosecutor the guarantee will invalidate the patent for the entire duration of protection, if it determines that:
  - the subject of protection is not an invention
  - the invention is exempt from protection
  - the invention was not new, did not have an inventive step or was not industrially applicable (on the date of filing the application)
  - the invention is not fully and clearly described
  - a wider scope of rights is recognized.

Filing a patent application excludes:
  - do not post
  - do not sell
  - do not give lectures or presentations
  - submit a patent application before the competition
  - ask for expert advice

9. How to protect an invention outside the borders of Montenegro
Priority rights: When applying outside of Montenegro, it is possible to keep the date of submission of the first application, thus achieving the so-called right of priority but only within 12 months from the date of submission of the first application.
Legal protection of inventions outside of Montenegro can be achieved in three ways:
  - Through the national system:
    - Which implies the direct submission of an invention application to the patent offices in the countries where patent protection is sought

- This method of protection is used when protection is desired in a small number of countries (from 3-4 countries)
- The application is submitted in accordance with the national legislation of the country in which protection is sought
- When applying abroad, it is possible to retain the date of submission of the first application if the application is submitted within 12 months from the date of submission of the first application

o Through the PCT system

An international application is an application submitted in accordance with the Patent Cooperation Treaty (PCT).

- The PCT system is a patent filing system, not a patent recognition system
- Patents are recognized exclusively by national institutes and regional patent organizations
- Benefits that the PCT system provides to the applicant:
- Submits one international application which starts the process of patent recognition in all signatory states (148 countries)
- In one place, in one language, with one fee
- Entry into the national phase is postponed for 30 months
- Report on the international search of the state of the art
- An international application can be submitted directly to the International Patent Bureau of the World Intellectual Property Organization - WIPO and the Institute for Intellectual Property of Montenegro, if the applicant is a citizen of Montenegro or a natural person who has an approved permanent residence in Montenegro or a legal entity based in Montenegro
- The application must be submitted before the expiry of the period of 12 months from the date of submission of the national application
- The last amendment to the PCT procedure gave the possibility to issue a statement on the licensing of the reported invention (the data is published in the patent scope)
- The PCT system is a patent filing system, not a patent recognition system
- Patents are recognized exclusively by national offices and regional patent organizations. An international application in which Montenegro, in accordance with the Agreement, is designated or selected for the recognition of a national patent is considered a request for the extension of a European patent to Montenegro, and the European Patent Office will act as a designated or selected office in accordance with the Agreement. The European Patent Office acts as an authority for international search and preliminary examination of international applications.

o Through the European application system

The European patent recognition system is prescribed by the European Patent Convention.

The decision is made by the applicant after analysing the costs as well as the business ambitions he is aiming for.

- The European patent recognition system is prescribed by the European Patent Convention
- The applicant can, by submitting one application directly to the European Patent Office, request protection in several member countries of the European Patent Organization (38 in total) and in the signatory countries of the Agreement on the Extension of the European Patent (ME and BIH), and the European Patent Office has also signed the Validation Agreement, which entered into force, with Morocco and the Republic of Moldova
- The procedure for granting a patent is carried out by the European Patent Office

- A European patent application for which an extension fee has been paid and an extended European patent have the same prior art effects as a national patent application and a national patent
- After the recognition of the European patent, the patent holder must submit to the Office, within three months from the date of publication of the information on the recognition of the European patent: a translation of the patent claims, proof of payment of costs for publication and proof of payment of annual maintenance (for the years following the year in which the information on the recognition of the European patent was published)
- If the translation is not submitted on time, it is considered invalid from the beginning.

An ***example*** of the patenting process in the US:
University Legal department will request outside patent counsel to work with the University inventor(s) to prepare U.S. nonprovisional and international patent applications. The outside patent counsel will schedule an initial call with the primary University inventor point of contact (POC) to discuss the invention, determine whether additional materials are needed from the inventors, and discuss a mutually acceptable schedule for drafting and reviewing the application. Outside patent counsel will typically send a first draft of the patent application to the University inventor POC within 1–2 weeks of the initial call and request feedback on the technical accuracy and completeness of the application as well as the scope of the claims. Once the feedback is received, outside patent counsel will typically iterate to provide a second draft within 1 week for final technical review by the University inventor POC. After any final inventor feedback is incorporated into the draft, outside patent counsel will send the final draft to University Legal department for final review before the application is filed at the USPTO. The entire preparation process, i.e., from the initial call with the University inventor POC to USPTO filing, can take 4–6 weeks but varies based on the technical complexity of the invention, any additional iterations of the draft that may be required, and the availability and responsiveness of the University inventor POC during the review period. After filing, patent applications are initially treated on a confidential basis by the USPTO, but most are published by the USPTO 18 months after the application's earliest effective filing date. All issued patents are published by the USPTO. Since issued patents and most patent applications are made available to the public, seeking patent protection may not be suitable for all University inventions because of the nature of the inventions and/or sponsor sensitivities. Within approximately 1–2 years of the filing date, depending on the technology, University Legal department will receive written notice from the USPTO as to whether the application and its claims have been accepted in the form as originally filed. More often than not, the USPTO rejects the application because the claims are determined to be unpatentable over the "prior art" (for example, in the form of earlier patents or publications in the relevant technical field). The written notice sent by the USPTO is referred to as an Office Action. If the application is rejected, University Legal department coordinates with outside patent counsel to prepare a written response to the Office Action, and this response is typically filed at the USPTO within 3 months of the date of the Office Action. Generally, the written response may seek to amend the claims to overcome the teachings in the prior art and/or point out why the USPTO's previous rejection was incorrect. This procedure of receiving an Office Action and submitting a written response to persuade the USPTO to withdraw its rejection and allow the patent application to issue as a patent is referred to as patent prosecution. It is not unusual for several iterations of patent prosecution to take place before the USPTO allows the patent application or a decision is made to abandon the patent application. During the patent prosecution process, University Legal department may request input from the inventor(s) to confirm the technical aspects of the invention and/or the prior art cited against the application by the USPTO. It may take on average 2–4 years for a patent to be issued after the patent application filing date.

What if I created the invention with someone from another institution or company?

If you created the invention under a sponsored R&D agreement with a company, TTO in co-ordination with University Legal Department will need to review the agreement to determine ownership and other rights associated with the invention and to determine the appropriate next steps. If the technology was jointly developed with staff from another academic institution, TTO will usually enter into an inter-institutional agreement that outlines which institution will take the lead in protecting and licensing the invention, how expenses associated with the patenting process will be shared, and how licensing revenues will be allocated.

Will University initiate or continue patenting activity without an identified licensee?

University may choose to accept the risk of filing a patent application before a licensee has been identified. After University's rights have been licensed to a licensee, the licensee generally pays the patenting expenses. At times TTO may discontinue further patent prosecution after a reasonable period of attempting to identify a licensee (or if it is determined that University cannot obtain reasonably valuable claims from the national patent office).

Is there such a thing as a provisional patent?

No. The Patent Law of Montenegro does not recognize a provisional patent.

How much does it cost to obtain a patent?

Articles of the Law on Patents of Montenegro that define the costs of obtaining a patent in Montenegro [MNE-Patent Law, 2005]:

> *Administrative fees and fees for special costs of the procedure*
> *Article 16*
> (1) In the procedure before the competent authority, administrative fees shall be paid in accordance with the law regulating administrative fees, fees for special costs of the procedure and fees for the provision of information services.
> (2) The amount of fees for special costs of the procedure and fees for the provision of information services shall be determined by the Government of Montenegro (hereinafter: the Government).
>
> *Maintenance of patent and patent application rights*
> *Article 81*
> (1) Prescribed administrative fees shall be paid for the maintenance of rights from patent applications and patents.
> (2) The fees referred to in paragraph 1 of this Article are paid for the third and each subsequent year, and are due for collection on the day the year expires, counting from the date of filing the patent application.
> (3) Fees for the maintenance of the original application that are already due on the date on which the separate application is submitted are also paid for the separate application when the separate application is submitted.
> (4) If the patent applicant, i.e. the patent holder, does not pay the fee from para. 1 and 3 of this article, the fee can be paid within an additional period of six months, provided that the prescribed additional fee is paid.
> (5) The applicant, i.e. the holder of the patent, is obliged to provide the competent authority with proof of the payment of the fees referred to in para. 1 and 3 of this article.
>
> *Maintenance fees*
> *Article 150j*
> (1) Fees for the maintenance of European patents are paid to the competent authority

for the years following the year in which the information on the recognition of the European patent was published, in accordance with special regulations.

(2) The provision of Article 141, paragraph 2 of the Convention shall apply accordingly to the payment of the fee for the maintenance of rights from paragraph 1 of this Article.

Failure to pay the fee
Article 82
If the patent applicant or patent holder fails to pay the prescribed fee for maintaining the rights from the patent application or patent, that right shall cease on the day following the expiration of the period referred to in Article 81 paragraph 2 of this law.

The amounts of fees to be paid for all requests in the patenting process are published in the official document of the state of Montenegro: LAW ON ADMINISTRATIVE FEES ("Official Gazette of Montenegro", No. 018/19 of March 22, 2019).

What is the time line of the patenting process and resulting protection?

According to the presented procedure for patent protection of an invention, the average duration of the patent process is from 2 to 4 years, depending on the technology being protected. Once a patent is issued, it is enforceable for 20 years from the initial filing date of the patent application that resulted in the patent, assuming that maintenance fees are paid after the patent issues.

What other forms of IP protection are considered besides patents?

TTO coordinates with University Legal department to determine what form of IP protection is most appropriate and necessary based on, for example, the nature of the IP and how the IP is likely to be utilized and/or commercialized. Besides patents, other forms of IP protection include copyrights, trade secrets, and trademarks.

According to the national legislation in the field of intellectual property protection in Montenegro, the mentioned forms of IP protection are defined as follows:

- COPYRIGHTS refers to the protection of authors' rights over their creative and original literary, scientific and artistic works. The subject of copyright protection is an author's work, and the author is a natural person who created that work. In the event that several authors participated in the creation of the author's work, then it is a co-authored work. An author's work means an original (original) intellectual achievement from the literary, artistic and scientific fields that has an individual character and is expressed (materialized) in a certain way.
- TRADE SECRET means confidential business information that is not generally known in the relevant business circles, and at the same time has a high commercial value and ensures its owner a competitive advantage on the market.
- A TRADEMARK is a legally protected sign that serves to distinguish the goods and/or services of one natural or legal person from the same or similar goods and/or services of another natural or legal person. A trademark can be any sign (word, logo or image) that distinguishes the products and services of one company or organization from the products and services of another company or organization.

According to the legislation in the USA, the three forms of IP protection are as follows:

- ***Copyrights*** are a form of IP protection provided by federal laws to the authors of "original works of authorship." These include literary, dramatic, musical, artistic, and certain other intellectual works, including computer software. This protection is available to both published and unpublished works. The federal Copyright Act generally provides the owner of a copyright the exclusive right to conduct and authorize various acts, including reproduction,

public performance, and making derivative works of the original work. Copyright protection is automatically secured when a work is fixed into a tangible medium such as a book, software code, video, etc. In some instances, a copyright may be registered, but registration is generally unnecessary until a commercial product is ready for manufacture or a copyright enforcement action is ready to be initiated.

- ***Trade secrets*** are proprietary information (e.g., practices, formulas, processes, designs, compilations) that derive value from not being known by the public and that are reasonably protected to maintain secrecy. Once a trade secret is disclosed (for example, in a patent), it is no longer a trade secret. Trade secret protection attaches immediately with no requirement for registration. The duration of protection may last indefinitely as long as the proprietary information remains secret. However, the protection may be fragile as inadvertent disclosure of the proprietary information may negate the protection. Trademarks include any word, name, symbol, device, or combination that is used in commerce to identify and distinguish the goods of one manufacturer or seller from those manufactured or sold by others, and also to indicate the source of the goods. In short, a trademark is a brand name. A service mark is any word, name, symbol, device, or combination that is used, or intended to be used, in commerce to identify and distinguish the services of one provider from those of others, and to indicate the source of the services.
- ***Trademark*** registration is a procedure in which the USPTO determines rights based upon legitimate use of the mark. However, it is not necessary to register a trademark or service mark to prevent others from using the trademark. Trademarks generally become protected as soon as they are adopted by an organization and used in commerce, even before registration. With a federal trademark registration, the registrant is presumed to be entitled to use the trademark throughout the United States for the goods or services for which the trademark is registered.

How is IP handled in University's R&D contracts with the government of Montenegro?

In Montenegro, the relationship between institutions that finance scientific research and innovation projects from the budget, that is, from public funds (ministries responsible for science and technological development and innovation activities; innovation fund, etc.) and organizations that implement these projects (universities, institutes, companies, non-governmental organizations) is regulated by their mutual contracts. Within those contracts, the method of disposal of the intellectual property created by the realization of the projects is also defined. The bottom line is that the institutions that finance scientific research and innovation projects from public sources transfer the right to use the intellectual property created by the implementation of the projects to the project implementers.

An example from the Agreement on Research Funding by the Ministry of Science of Montenegro, namely the articles of the Agreement that regulate IP rights [given according to the copy of the Agreement in which the Grant Holder is UDG]:

> *Article X1:*
> *The use of intellectual property rights, resulting from the results of the project, is determined by a special contract or agreement, which the Grant Holder signs individually with each of the partners and in accordance with the regulations governing intellectual property rights.*
> *Article X2:*
> *The results of the project will not be disclosed to a third party without the prior consent of the contracting parties.*
> *Article X3:*
> *The holder of the grant undertakes to state, when publishing and presenting the results of the project, that it came true as a result of the implementation of a research program on a project co-financed by the Ministry.*

3.5. MARKETING OF IP

What is IP marketing?

IP marketing is a strategy of IP commercialization, which helps not only to promote existing IP assets, but also to convince businesses of the marketability of potential innovations. Therefore, the first step in the IP marketing process is to assure that there is an application for the technology. Further, Patent Landscape Reports can help you understand the situation in the market, including the important stakeholders, non-covered fields of use and potential partners [WIPO-int].

What does lab to market mean?

Lab to market (L2M) is the process of transferring new technologies from the laboratory to the marketplace. Several factors at the market level are necessary to generate effective technology transfer processes, such as sufficient firms that are able to invest the money, time, and efforts to turn the IP into marketable products; a market that is ready to buy the product once it has been fully developed and is ready for sale; an absorption capacity to assimilate new knowledge and apply it to commercial ends. At the same time, universities and research institutions also have several market-related challenges to address in order to establish successful technology transfer agreements [WIPO-int].

What are the main challenges of transferring academic technology to the market?

IP marketing in the context of technology transfer – another market-related challenge for TTOs is how to market technology that has potential. This includes identifying appropriate markets, attracting business partners that can further develop, manufacture and disseminate products based on university's IPRs, communicating effectively with potential consumers, and transmitting the right messaging.

How does TTO market IP?

TTO technology experts use many sources and strategies to identify potential licensees and to market IP. These include leveraging existing relationships of the inventors, the TTO staff, and other researchers; conducting market research; examining other complementary technologies and agreements; using the external TTO website to post IP and related marketing materials; and seeking direct contacts through conferences and industry events. Staff publications and presentations often serve as excellent marketing tools as well.

How are most licensees found?

Studies have shown that 70% of licensees in university-based technology transfers are already known to inventors. Thus, inventors are often the primary source for potential licensees. Licensees are also identified through existing relationships of the TTO staff. University licensees often license more than one technology from University. TTO attempts to broaden these relationships through contacts obtained from website posting inquiries, market research, industry events, and the cultivation of existing licensing relationships.

How long does it take to find a potential licensee?

It can take months and sometimes years to locate a potential licensee, depending on the attractiveness of the IP, its stage of development, competing technologies, and the size and intensity of the market. Most University IP tends to be in the early stage in the development cycle and thus requires substantial commercialization investment, making it difficult to attract a licensee.

How can TTO help improve the marketability of early-stage IP?

TTO experts manages a small budget that focuses on investing in IP with a *technology readiness level* (TRL) that can be increased with a small amount of funding. The appropriateness of this funding for a given IP is often discussed as part of the initial inventor discussion with TTO. Proposals are solicited and may be awarded throughout the fiscal year.

How can I assist in marketing IP?

Your active involvement can dramatically improve the chances of matching IP to an outside company. Your R&D and (if applicable) consulting relationships are often helpful in identifying both potential licensees and technology champions within companies. Once interested companies are identified, the inventor is the best person to describe the details of the IP and its technical advantages. The most successful technology transfer results are usually obtained when the inventor and TTO work together as a team to market the technology. TTO welcomes input from inventors during its marketing and licensing efforts.

3.6. SELECTING A LICENSEE

Can there be more than one licensee?

Yes, IP can be licensed to multiple licensees, either nonexclusively to several companies or exclusively to several companies, each for a unique field of use (application) or geography.

What is a license? What is a licensing agreement?

A license is a consent by the owner of IP (Licensor) to the use of IP by other party (Licensee) in exchange for money or other value (cross – license).

LICENSING AGREEMENTS are legally binding contracts where the owner of intellectual property (IP) in a valuable technology (the licensor), gives someone else (the licensee) permission to use that IP in ways (terms) that are spelled out in the agreement.
Permits another party to:

- make, have made, use, sell, import (patents);
- copy, display, distribute, modify, make derivative works (copyright).

How is a company chosen to be a licensee?

For a commercial license, a licensee is generally chosen, barring any objections or concerns expressed by the University, based on its ability to commercialize the technology for the benefit of the general public. Sometimes an established company with experience in similar technologies and markets is the best choice. In other cases, the focus and intensity of a start-up company is a better option. TTO conducts market research, taps its professional networks, and performs various evaluations and due diligence to determine the most suitable licensee. In the case of transitioning IP, generally the sponsor will specify the desired licensee. It is rare for University to have multiple potential licensees bidding on its IP.

What can I expect to gain if my IP is licensed?

Per University IP policy, University inventors share in licensing income resulting from University technology transfer agreements, including licenses. In addition, most inventors enjoy the satisfaction of knowing that their IP is being deployed for the benefit of the general public or to

support the critical mission needs of our government funding institutions. New and enhanced relationships with businesses and public funding institutions are another outcome that can augment R&D efforts. In some cases, additional sponsored R&D may result from the license.

What is the relationship between an inventor and a licensee, and how much of my time will it require?

Many licensees request and offer to fund the active assistance of the inventor to facilitate their commercialization efforts, at least at the early stages of development. This assistance can range from infrequent, informal contacts outlined in an IP license agreement to a more formal consulting relationship facilitated through University Contracts. Working with a new business start-up can require substantially more time, depending on the inventor's role in or with the company and their continuing role at University. Participating in a start-up while being concurrently employed by University is subject to University's personal conflict of interest policies and contingent on the approval of your management chain and University management.

3.7. LICENSING

What other types of agreements and considerations apply to technology transfer?

Technology Transfer Agreements
The transfer of knowledge and information about technology can take place in two ways: informally through transfer of knowledge, and formally through technology transfer agreements (contracts).

Informal transfer of knowledge is becoming more and more important in the academic environment as the mobility of researchers and students is greatly contributing to the dissemination of knowledge worldwide. Knowledge can also be transferred through publications, teaching, conferences, courses, presentations, meetings, informal exchanges and personal contacts between scientists, academia and industry.

In the context of formal channels of technology transfer, there is no such thing as a standard contract or agreement. Some universities and research institutions propose standard models as part of their IP policies, but such models are only to be used as a starting point, a support or a tool, and need to be adapted to the specific circumstances and requirements of each case. It is crucial to consult an IP lawyer from the beginning of the negotiation and in particular when signing the agreement.

There are different types of technology transfer agreements that are frequently used to transfer technology from lab to market [WIPO-int]:

- **Technology transfer licensing agreements**

Licensing agreements are legally binding contracts where the owner of intellectual property (IP) in a valuable technology (the licensor), gives someone else (the licensee) permission to use that IP in ways (terms) that are spelled out in the agreement.

These terms determine the rights of the licensee: a broad license for any purpose in any territory and field of use, or a narrow license only for distribution or manufacturing in defined territories or technologies, or somewhere in between.

A license is a consent by the owner to the use of IP in exchange for money or something else of value (e.g. cross licensing). It becomes an actual transfer when the licensor delivers the technology and knowledge to the licensee and the licensee learns how to effectively use,

adapt and where possible improve the technology and knowledge.

- **Assignments of intellectual property rights**

An assignment of IP rights involves the transfer of ownership of IP (patent, utility model, trademark, copyright, know-how protected by a trade secret etc.) from the owner (assignor) to the assignee (physical or legal entity) with permanent effect.

The assignment contract must accurately identify the subject matter of what is assigned. In case of patented inventions for instance, this may include granted patents but also provisional patent applications, including PCT applications, or trade secrets that are intended to remain as such.

The difference between licensing and assignment of IP is that in licensing relations the right to use the IP is temporarily transferred to the licensee, often giving the licensor the right to continue to exploit the same IP in a different field of use or territory. Under negotiated conditions a licensing agreement can be terminated and all rights transferred back to the licensor. On the other hand, an assignment of IP rights has a definitive effect, like selling tangible assets, thus the former owner will be permanently divested of the ownership.

- ï **Confidentiality agreements**

Non-disclosure agreements (NDAs) or confidentiality agreements are legally binding agreements not to disclose confidential information that a party has learned, or not to use it for any purposes other than those specified in the agreement.

They are often used before an IP license or other agreement is established, when the licensee wishes to have further detailed information about the IP or technology concerned. In the context of a collaboration agreement for instance, both parties may take an obligation not to disclose or use the information regarding background IPRs of the other party.

An important condition for NDA to be efficient is to set up a clear definition regarding what information is considered confidential, who will have access to it, what are the measures to be taken in order to keep it confidential and to limit those obligations to a reasonable period of time.

- **Collaborative research agreements**

Collaboration agreements or collaborative research agreements are concluded by two or more parties that wish to cooperate to develop and possibly commercialize a new technology.

The parties invest their human, physical and financial resources, assets (including background intellectual property rights) and skills. They jointly define the objectives and legal framework of the collaboration, including intellectual property rights ownership, access rights, benefits and risks sharing and rights to commercialize the research results.

This type of agreement may be used in the context of academic research collaborations, in particular under research grants, as well as for university-industry joint research projects, including PhD projects.

- **Consultancy** agreements

Consultancy agreements involve consultancy work by university professors and/or researchers who provide expertise services to an industry partner in exchange for payment, often on a personal basis, if allowed by the university's policy.

In most cases, the resulting intellectual property rights are owned by the company, with limited rights of the researcher to publish his or her results. The IP ownership of developed results may also be shared, depending on the Institutional IP Policy of the academic institution and terms of the agreement.

When involved in negotiations, the university will try to preserve the right of the researcher to publish results of his/her work, while keeping information confidential for a reasonable period of time, to allow the company to protect IP and assure position on the market.

- **Sponsored research agreements**
  Sponsored research agreements govern the relationship between a university or research institute and a sponsor, that may be a government body or commercial entity interested in developing scientific results in a particular area of relevance for its business.
  The R&D institution receives funding to support the research in return for preferential access and/or rights to IP deriving from the research results. Contrary to collaboration agreements, the sponsor does not necessarily participate in research activities and may not be interested in the commercialization of the results. The university / R&D institution usually owns the results and IP developed and grants a license (exclusive or non-exclusive) to the sponsor.

- **Material transfer agreements**
  Material transfer agreements (MTAs) govern the transfer of physical assets and tangible research materials from the provider to the recipient that intends to use them for the purpose of its own research.
  The transferred assets may include patented materials transferred through a license, biological materials, chemical compounds or software. The agreement defines the rights and obligations of the parties regarding the transferred materials, derivative materials, research results and related intellectual property rights.

- **Contract research agreements**

Contract research agreements are concluded when a commercial company "hires" a university or a research institute to conduct research towards a commercial goal.

The objectives of the research are defined by the company and the goals are commercial, not academic. The contractor fully covers the research costs and IP protection and bears all the risks for the research. The results are usually owned by the company, with patented inventions or other intellectual property rights assigned by the university to the contractor.

- **Academic spin-off agreements**

Academic spin-offs (or spin-outs) are newly-created companies based on a new technology developed by a university or research institution.

The researchers involved in the development of the new technology often leave their original position at the university and end up in the new company. The university and the spin-off company usually share risks and benefits through different forms of joint venture arrangements. Spin-offs are often owners or exclusive licensees of the IPRs on technologies developed at the university.

- **University research-based start-up agreements**
  A university research-based start-up is a company built on a university granted license for one or more technologies.
  As opposed to a spin-off company, the founders of a start-up are not affiliated with the university where the new technology has been developed and the company's financial resources are drawn from external sponsors.
  The agreement concluded between a university or a research institution and a start-up company need to address some key considerations such as: IP, financial conditions, management obligations, conflict of interest concerns, participation and support of the university inventor, commercialization or business plan with development milestones and a pathway to market launch and exit.

- **Joint venture agreements**
  A joint venture is a business entity created by two or more parties pooling their resources with the objective of implementing a common business purpose. It is generally characterized by shared responsibility, governance, risks and benefits.
  For example, one party may contribute with technology or know-how and the other party

may provide investment. This is often the case in joint ventures between academic institutions and industry partners. One of the important factors of successful joint ventures is an early adoption of intellectual property rights principles chart, regulating issues such as the use of the proprietary information and background IP that each party brought into the collaborative business.

- **WIPO model contracts for academic institutions**
  In order to support academic institutions in the development and negotiation of technology transfer contracts, WIPO provides model agreements between academic institutions and industry partners. Since licensing is the most frequently used means for technology transfer, the models provide insights into different types of licensing agreements such as know-how licensing, exclusive, software licensing, etc. The models are accompanied by guidelines for customization focusing on challenging issues for technology transfer offices, such as negotiating an audit for royalty rates on the revenues collected by industry partners from sub licensees.

3.8. COMMERCIALIZATION

What is IP commercialization in the context of technology transfer?

IP commercialization is the process of creating economic value by converting knowledge, discoveries and inventions into new or significantly improved products and services [WIPO-int].

What je IP commercialization process?

The IP commercialization strategy can be different at each university or research institution, but usually involves the following steps [WIPO-int]:

- submission of the invention or discovery to TTOs (usually through invention disclosure forms);
- evaluation (assessment to determine technical superficity, IP status and potential market value of the invention – base for "go" or "no go" for protection and commercialization);
- protection (intellectual property or other type of protection);
- business case and commercial plan;
- IP marketing;
- licensing – as the most frequently used technology transfer means;
- product development plan; and
- market dissemination and commercialization.

What are the benefits of research outcomes commercialization?

The benefits of research outcomes commercialization are usually shared among different partners ranging from universities and research institutions to inventors, research departments, investors, private sector, etc. Many universities and research institutions have well-defined policies to support, encourage and enable the commercialization of knowledge and technology. They may include the establishment of knowledge transfer offices and associated policies for invention support, creation of start-up and spin-off companies, programs to sustain company development, incubators and accelerators, research parks, and participation in organizations and networks focused on IP commercialization [WIPO-int].

What activities occur during commercialization?

Most licensees continue to develop IP to enhance the technology, reduce risk, prove reliability, and satisfy the market requirements for adoption by customers. This can involve additional testing;

prototyping for manufacturability, durability, and integrity; and further development to improve performance and other characteristics. Documentation for training, installation, and marketing is often created during this phase. Benchmarking tests are often required to demonstrate the product/service's advantages and to position the product in the market.

What is my role during commercialization?

Your role can vary depending on your level of interest and desire to be involved, the licensee's interest in engaging with University inventor(s) to further support transition of the technology, and any contractual obligations related to the license. Any role outside of your employment at University is governed by University's IP policy and should be reviewed by your management chain and University's management before it is undertaken.

What revenues are generated for University if commercialization is successful?

Most licensees are obligated to pay licensing fees that can be very modest (for start-ups or situations in which the value of the license is deemed to warrant a modest license fee) or can reach hundreds of thousands of EUR. Royalties on the eventual sales of licensed products or services based on University IP can generate revenues, although this can take years to occur. Equity, if included in a license, can yield returns but only if a successful equity liquidation event (e.g., public equity offering or a sale of the company) occurs. As a result, most licenses do not yield substantial revenues, especially in the near term. Some study of licenses at U.S. universities demonstrated that only 1% of all licenses yield over $1 million. However, the rewards of University IP reaching the market and making an impact are often more significant than the financial considerations alone. Licenses used to transition University IP to another party at the direction of a sponsor are typically provided at no cost because of organizational conflict of interest concerns. However, these licenses are vital to the support of University's overall mission.

Can the IP be licensed to another entity?

Licenses typically include performance milestones, and not meeting those milestones can result in a license being changed from exclusive to nonexclusive, a license's field of use being narrowed, or even a license being terminated. These measures would enable subsequent licensing to another company if a start-up company or licensee is unsuccessful in commercializing the technology.

3.9. REVENUE

How are license revenues distributed?

TTO is responsible for managing the patent expenses and license income (e.g., derived from license execution fees, milestone payments, royalties) associated with technology transfer agreements. University's primary goal with respect to technology transfer is to make an impact for the benefit of the nation, our sponsors, and the public at large—not to generate licensing income. However, to incentivize staff participation in the technology transfer process, University shares license income earned from commercialization of IP with University inventors.

An example of the distribution of license revenues at a University in the USA:

Accounting and Finance distributes license income from technology transfer agreements as follows:

- The first $5,000 is split among the inventors.

- After deductions for expenses and administrative fees, the net cash income is further divided as follows:
  - 30% to the inventors;
  - 60% to the University Development Fund (supports technology transfer activities, including technology transfer grants, inventor engagement, recognition events and awards, development funding, and education and training);
  - 10% to the University Discretionary Fund.

Therefore, technology transfer activities at University may generate income that is shared among University, its inventors, and, if applicable, partnering institutions. This income is reinvested in additional R&D and education, thus fostering the creation of the next generation of R&D, inventors, and entrepreneurs.
In addition, the resultant relationships created and deepened with these technology transfer activities support University's mission. They result in additional R&D projects and broader R&D opportunities, collaborative investments, and an enhanced ability to create, retain, and share valuable resources.

3.10. COMPUTER PROGRAMS

A software patent is a patent that protects computer software. Software patents can cover a stand-alone computer software program, a mobile device app, or software that is integrated into a mechanical device. In order for software to be patentable, it must meet the same requirements of any other type of invention.

Computer software or programs are instructions that are executed by a computer. Software is protected under copyright law and the inventions related to software are protected under patent law.

As a general rule of thumb, if the invention is easily reverse engineered, then patent protection is likely the best option. If the invention is not easily reverse engineered, then trade secret protection may be the better option.

Can I protect software with a patent?

Computer technology penetrates nearly all areas of our life, not only in business environments but also in daily surroundings. A computer cannot operate without instructions. These instructions, so-called computer programs or software, may be incorporated in the computer or any other apparatus, but are often stored, reproduced and distributed on portable media such as CD-ROMs or transmitted on-line [WIPO-int].

Once created, it is often possible to reproduce software easily at very low cost in an unlimited number. Although copyright protection is available for "literal expressions" of software, it does not protect the "concept" behind the software, which often is a core part of its commercial value. Since such concepts behind the software often provide technical functions, such as controlling machines or processing data, protection of software through the patent system is often available to protect such technical functions.

Generally, several approaches have been taken in protecting software by patents. While some countries grant patents for all types of software, in many countries, in addition to, inter alia, the schemes, rules and methods of performing mental acts, scientific and mathematical theories, the computer programs are expressly excluded from patentable subject matter. However, in many of those latter countries, the computer programs are only not patentable "as such" thus making

it possible to obtain patent protection for computer-related inventions having a technical character. As reasons for excluding software from patent protection, it is often said that innovation in this field typically involves cumulative, sequential development and re-use of others' work, and that the need to preserve interoperability between programs, systems and network components does not fit with the mechanisms of the patent system because the range of options available to the second comer may be constrained. On the other hand, some argue that patent protection of computer software is necessary in order to provide adequate incentive for investment in this field and to support innovation in various technological areas which increasingly develop together with computer technology.

In recent years, another similar issue arose, namely the question of the patentability of business methods. Traditionally, business methods have been either in the public domain or protected under trade secret law. Today, however, information technology offers possibilities for new business models, using information technology as a tool for processing and transmitting various data, such as technical, commercial and financial data. Due to high economic stakes put on those new business methods and the expansion of e-commerce in our society, the debate on the feasibility of patenting business methods has continued at various fora.
The European Patent Convention states that software is not patentable. But laws are always interpreted by courts, and in this case interpretations of the law differ. So, the European Patents Office (EPO) grants software patents by declaring them as "computer implemented inventions".

In the Member States of the EU, as in most other countries, there is a rule whereby software as such (not geared to an industrial application and not constituting a technic- al contribution to it) is not patentable. It benefits from protection through copyright, just like a literary work.

So, software can be patented only if it is attached to an invention and the software is a component of that invention. To avoid the claim of Section 3(k) of the Patent Act, 2002, the hardware must be a part of the invention along with the computer program and the software.

Neither software nor computer programs are explicitly mentioned in statutory United States patent law. Patent law has changed to address new technologies, and decisions of the United States Supreme Court and United States Court of Appeals for the Federal Circuit (CAFC) beginning in the latter part of the 20th century have sought to clarify the boundary between patent-eligible and patent-ineligible subject matter for a number of new technologies including computers and software. The first computer software case in the Supreme Court was Gottschalk v. Benson in 1972. Since then, the Supreme Court has decided about a half dozen cases touching on the patent eligibility of software-related inventions.

The eligibility of software, as such, for patent protection has been only scantily addressed in the courts or in legislation. In fact, in the recent Supreme Court decision in Alice v. CLS Bank, the Court painstakingly avoided the issue, and one Justice in the oral argument repeatedly insisted that it was unnecessary to reach the issue. The expression "software patent" itself has not been clearly defined. The United States Patent and Trademark Office (USPTO) has permitted patents to be issued on nothing more than a series of software computer instructions, but the latest Federal Circuit decision on the subject invalidated such a patent. The court held that software instructions as such were too intangible to fit within any of the statutory categories such as machines or articles of manufacture.

On June 19, 2014 the United States Supreme Court ruled in Alice Corp. v. CLS Bank International that "merely requiring generic computer implementation fails to transform [an] abstract idea into a patent-eligible invention."

Under the current patentability regime in the United States, software patent applications must meet one of the following two requirements to be patent eligible:

- the invention should be much more than an "abstract idea," or
- if the invention is directed to an "abstract idea," then it must include/claim additional elements that "transform" the abstract idea into a patent-eligible application.

Can I protect software with a patent in Montenegro?

It is not possible to obtain a patent for software in Montenegro. Article 5 paragraph (5) of the Law on Patents explicitly states what is not considered an invention [MNE-Patent Law, 2005]:

> Article 5
> …
> (5) The following are not considered to be inventions, in the sense of this law, in particular:
> 1) discoveries, scientific theories and mathematical methods;
> 2) aesthetic creations;
> 3) plans, rules and procedures for performing intellectual activities, for playing games or for performing tasks;
> 4) computer programs;
> 5) display of information.
> (6) Objects or activities from paragraph 5 of this article are excluded from protection only to the extent that the patent application or patent relates to that object or activity, as such.

3.11. FOOD AND PATENTING

Patent Class 426 allows for the patenting of foods and recipes. The language of this rule covers foods and edible materials. The law views food as a composition of matter, which is one of the categories eligible for patents. An inventor can create a new composition that alters the structure in an innovative way.

The challenge of securing the world's food supply calls for further research and incentives to develop innovative agricultural solutions. The revenue potential of intellectual property (IP) rights is a key driver of innovation. In the sphere of agriculture, patent law, plant variety protection rights (breeder's rights) and rights over genetic resources are particularly relevant.

To ensure global food security, agricultural innovations need to be affordable and farmers need an incentive to adopt them – in sum, the economic benefit of using these technologies needs to outweigh their cost. While some commentators argue that this does not necessarily translate into higher prices per unit of farm produce, it seems clear that if farmers' incomes do not rise in real terms then they will be unable to pay for the new technologies and new varieties required to boost agricultural productivity. If farm-gate prices stagnate the question of access to these technologies is likely to become the subject of hot public debate.

Rising levels of food insecurity are likely to intensify debates about the patenting of seeds and fuel calls for compulsory licensing provisions akin to those established to deal with public health crises. Similar debates may also ensue in relation to products that protect plants against pests and disease.

Any debate on seeds must consider the UPOV7 system and its flexibilities which reside in exceptions to the breeder's right8. The exception to the breeder's right to use protected varieties to breed new varieties without the authorization of the right holder accelerates breeding and

innovation. The so-called "farmers' privilege" which UPOV members have the option to introduce into their national legislation can, however, be a double-edged sword. While it sounds reasonable that a small farmer should be able to use seeds produced on his or her own farm without paying a licence fee, excessive use of this exception can have serious implications for plant breeders and their ability to develop locally adapted varieties. Finding the appropriate balance is a thorny but necessary question for agricultural policy-makers.

The provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) introduce an important perspective to this question. They seek to establish a concrete balance between access to biodiversity for incremental innovation and benefit-sharing to reward farmers for on-farm conservation and management of such biodiversity. The principal aim of the ITPGR is to "facilitate the exchange of seeds and other germplasm for research, breeding, and crop development." It essentially creates a multilateral gene pool. Those creating commercial products that incorporate its plant genetic resources must pay a percentage of their profits into a fund used to promote conservation and sustainable use of plant genetic resources except when such a product is available without restriction to others for further research and breeding (e.g. plant varieties protected according to the UPOV system). In such a case a voluntary payment is encouraged. The financial viability of the system hinges on the ability of private parties to be able to create and commercialize derivative products using the bank's materials. In sum, the treaty seeks to manage the intellectual property associated with a defined set of genetic resources resulting from a combination of collective and individual innovation to conserve a public good.

The importance of offering incentives to develop the innovative new technologies that will enable us to meet the challenge of food security in a context of climate change and rapid population growth cannot be overstated. The intellectual property system will, without doubt, have a key role to play in providing the incentives to foster the innovation required if we are to meet this challenge.

Can You Patent a Food?

This text was taken from the Internet – source: https://patentexperts.org/patent/how-to-get-a-patent/food-patent/

Yes, you can patent a food. When, how, and what patent to file will vary depending upon the type of food related invention you have created.

Why patent? A patent is used to prevent others from copying your invention and making or selling it. An inventor would file a patent if they plan to commercialize their invention. An inventor should first consider how to commercialize their new food invention and if filing a patent is worth it.

When to patent? A patent should be filed before a public disclosure is made about the invention. If you plan to show off your invention at the world cooking exposition, you should file a patent before presenting it to others.

It is important to verify that your food invention is eligible for a patent before continuing the patenting process. A patent attorney is the best person to provide advice and help determine what aspects of your food invention may be eligible for a patent.

You may be able to file a utility, plant, or design patent covering your food related invention.

The eligibility criteria for a food related patent is the same as for other patents. Eligibility criteria for a patent includes subject matter, novelty, nonobvious, and usefulness:

(1) ***Subject Matter Eligibility***

- To be eligible for a utility patent a food related invention must be either a process, machine, manufacture, or composition of matter.
- A design patent must be for the ornamental design of the invention. A design patent protects the aesthetic appearance of the invention.
- A plant patent covers any distinct and new variety of plant which has been asexually reproduced.

(2) ***Novelty***

- The invention must be novel, meaning new and never having been done before. Get familiar with the term "prior art" before you begin the application process.
- Prior art is any published literature describing any part of your claimed invention. Patent examiners spend a lot of their time searching through data bases to find prior art. You may not obtain a patent on anything that exists in the prior art. Prior art includes patents, patent applications, non-patent literature, and anything else that is publicly available.

(3) ***Nonobvious***

- The invention must not be obvious. Obvious to whom? The United States Patent and Trademark Office (USPTO) uses a standard called a Person Having Ordinary Skill In The Art (PHOSITA).
- If a PHOSITA would find the invention obvious, then it is not eligible for a patent. What a PHOSITA would find obvious varies with the art category and is subject to some debate.
- A PHOSITA in the art of food related inventions would vary based on the invention. A PHOSITA of genetically modifying a new food would be different than a PHOSITA of baking a new type of cake.

(4) ***Useful***

- The invention must be useful. This is an extremely low bar to meet, nearly anything can be considered useful.

Food Patent ***Examples***:

- Humans consume a wide variety of things for food. For each food product we eat there are many patentable inventions associated with the production, harvesting, processing, preparation, and presentation of the food. Consider the different possible ways a patent can protect your invention. You may file multiple types of patents on the same invention or break down a complex invention and patent each individual aspect in a separate application.
- Food Products – Yes, you can patent food products. A food product is something humans consume orally, including liquids. A utility patent directly protecting a food product would require the food is either a new composition of matter or a new manufacture. This protection would work well if you just discovered a new edible composition of matter or manufactured a new type of food.
- Food additive.
- Lab grown meat.
- Processed hummus.
- A utility patent can also indirectly protect your food product if it is related to a process or a machine. Say you created a new machine or process to turn apples into apple juice. You cannot patent the apple juice as a manufacture because apple juice is not new, but you can patent your new machine or process.
- The process of producing a food additive.
- The method of growing meat in a lab.
- The machine that processes hummus.
- Food products can also be protected with a design patent. If the food product has a significant aesthetic characteristic, it may be worth protecting under a design patent. If a bakery makes a new design for the way a bagel looks, a design patent would prevent other bakers from copying that design. A design patent can also protect packaging, arrangement, and display of food products.
- Frosting design on a cookie.

- Shape of a pasta noodle.
- Arrangement of a fruit platter.
- A plant patent can be used to protect food products that come from plants. You may file for a plant patent after developing a new variety of plant and asexually reproducing it. The plant patent protects all parts of the plant including the fruit and anything else edible. Plants can also be protected under a utility patent if they otherwise qualify.
- A new variety of apples.
- Sugarcane that contains more sugar.
- Purple spinach.
- Frozen Foods
- Yes, you can patent frozen foods. You can also patent frozen food related inventions such as better insulated packaging.
- Frozen berries (plant patent).
- Design of a frozen dessert (design patent).
- Frozen lab grown meat (utility patent).
- Process to freeze dry more effectively (utility patent).
- Food Recipes
- Yes, you can patent a food recipe. A food recipe is a process for preparing food and patentable as a utility patent. Sometimes the best protection may be to not file a patent and keep your recipe as a trade secret like Coca Cola or KFC's 11 Herbs & Spices.
- Formula for a drink.
- Recipe for hot sauce.
- Instructions to bake a chicken pot pie.
- Food Preservation Methods
- Yes, you can patent a food preservation method. A food preservation method is a process for preserving food and patentable as a utility patent. Keeping the steps in a food preservation process secret may offer more protection than filing a patent for the process.
- Method of sun-drying fruit.
- Pasteurization process.
- Canning technique.
- Food Packaging – Yes, you can patent food packaging. Food packaging may be protected by a utility patent if the packaging offers a new benefit, such as more volume per shelf space. Food packaging may also be protected by a design patent, which protects the aesthetic appearance of the packaging.
- The shape of a bottle (design and/or utility).
- More breathable packaging (utility).
- Colour layout of the package (design).

Design vs. Utility vs. Plant Patent for a Food Invention

What type of patent to file? Utility, design, and plant patents are all applicable to food inventions. A patent attorney is the best resource to help determine which type of patent would best protect your invention.
A utility patent protects the functional aspects of the invention, a design patent protects the aesthetic appearance of the invention, and a plant patent protects the plant (including fruit).
For illustration, consider the following example. You have a garden where you breed tomato plants. You breed a new variety and asexually reproduce it. As you run test on the new tomatoes you discover it contains a new flavor compound. You make a new machine that turns the tomatoes into sauce, dehydrates the sauce, and presses it into tomato shaped balls. You plan to sell these dehydrated sauce balls at the grocery store.

Different parts of the invention may qualify for a different type of patent.

Invention	Type of patent
Plant, tomato	Plant
Flavour compound	Utility (composition of matter)
Tomato shaped sauce ball	Utility (manufacture)
Apparatus that turns the tomatoes into the final product	Utility (machine)
The method of turning tomatoes into the final product	Utility (process)
The aesthetic appearance of the final product	Design

Food related patents cover a wide range of inventions and fields, it is important to consider the nature of the invention when deciding what patent to apply for.
If the invention does not have a physical appearance, it would be difficult to obtain a design patent. Say that your invention is a set of instruction of how to bake a cake. A utility patent could effectively protect the new method of baking the cake, but a design patent would serve little purpose.

Alternatively consider that your invention is a new design for a cake's icing. The design doesn't use any new type of icing or new method to apply it, but it does look different than any cake's icing before. Here you probably can't get a utility patent, but a design patent would cover the aesthetic appearance of your cake and prevent others from copying your designs.

If your new food invention comes from a plant, it may be protected by a plant patent or a utility patent. Consider a new variety of oranges that produce twice as much juice. A farmer who created this variety by cross breeding then asexually reproducing her plants would file for a plant patent. A scientist that achieved this by inserting a new gene into the plant, or via a new growing technique would file for a utility patent.

Some inventions are best protected by not filing a patent. Keeping your invention as a trade secret may allow you to protect it far longer than a patent would allow. Secret recipes such as for Coke or KFC's herbs and spices have allowed these companies to maintain a monopoly over their product longer than a patent would allow.

Determining the best way of protecting a food related invention can be a difficult decision. It is highly advisable to consult with a patent attorney. A patent attorney will consider your invention, and what you plan to do with the invention to provide guidance on which type of patent offers the most benefit.

Can I Patent a biotechnological product in Montenegro?

In Montenegro, it is possible to obtain a patent for biotechnological products. Article 50 of the Law on Patents explicitly states what is content of patent rights in biotechnology [MNE-Patent Law, 2005]:

Content of patent rights in biotechnology
Article 50

(1) If the patent refers to biological material that has specific properties, which are the result of a biotechnological invention, the rights from Article 49 of this law refer to

any biological material obtained from that biological material by propagation or multiplication, in the same or modified form, and which has these same properties.

(2) If the patent refers to a product that contains or consists of genetic information, the rights from Article 49 of this law also apply to any other material that contains that product, provided that it contains genetic information that performs its function, except for the human body, at any stage of its formation and development, and the discovery of one of its elements, including the sequences or partial sequences of the genes in which that product is incorporated and in which the genetic information is contained and performs its function.

(3) If the patent refers to a procedure that enables the production of biological material that has specific properties as a result of a biotechnological invention, the rights from Article 49 of this law also apply to biological material directly obtained by that procedure, as well as to any other biological material obtained in the same or modified form, by propagation or multiplication of directly obtained biological material, and which has the same properties.

4. BOOKS AND ARTICLES

4.1. BOOKS AND ARTICLES

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4.2. INTERNET RESOURCES

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5. GLOSSARY

DISEMBODIED TECHNOLOGY refers to knowledge or information that exists only in the form of data or intellectual property. This can include things like proprietary technology or information that is available to the public. It is the opposite of embodied technology, which refers to physical objects or devices that contain technology.

EMBODIED TECHNOLOGY refers to the knowledge and skills that are used to create products and equipment, including software. This means that technology is not just something that exists on its own, but is instead a part of the things we use every day. For example, the technology used to create a smartphone is embodied in the phone itself, making it possible for us to use it to communicate, take pictures, and access the internet. This is different from disembodied technology, which refers to knowledge and skills that are not directly tied to a physical product or piece of equipment.

An ***INNOVATION*** is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process) [OECD, 2018].

INTELLECTUAL PROPERTY (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce. IP is legally protected through patents, copyrights and trademarks, which enable people to earn recognition or financial benefit from what they invent or create.

A ***TANGIBLE ASSET*** is something you own that has value and you can touch or see, like money, equipment, or property. It's listed on a balance sheet along with other things you own. There are also other types of assets, like ones you can't touch, such as patents or trademarks.

An ***INTANGIBLE ASSET*** is something valuable that a company owns, but you can't touch or see it. It's not a physical thing like a building or a car. Instead, it's something like a brand name, a patent, or a copyright. These things can be very important to a company because they can help it make money or protect its ideas from being copied by others.

TECHNOLOGY BUSINESS INCUBATORS (TBIs) are organizations that help startup companies and individual entrepreneurs develop their businesses by providing a range of services, including training, brokering and financing [WIPO-Int].

TECHNOLOGY AND INNOVATION SUPPORT CENTERS (TISCs) help innovators access patent information, scientific and technical literature, search tools and databases, and make more effective use of these resources to promote innovation, technology transfer, commercialization and utilization of technologies. The WIPO TISCs program currently supports over 80 countries. WIPO supports its member states in establishing and developing TISCs in universities and other institutions in numerous countries around the world [WIPO-Int].

"***TECHNOLOGY TRANSFER*** (TT) is a collaborative process that allows scientific findings, knowledge and intellectual property to flow from creators, such as universities and research institutions, to public and private users. Its goal is to transform inventions and scientific outcomes into new products and services that benefit society. Technology transfer is closely related to knowledge transfer" [WIPO-int].

TECHNOLOGY TRANSFER is the process of transferring scientific findings from one organization to another to for the purpose of further development and commercialization [WIPO, 2022].

TECHNOLOGY TRANSFER OFFICES (TTOs) are usually created within a university in order to manage its intellectual property (IP) assets and the transfer of knowledge and technology to industry. Sometimes, the mandate of TTOs with respect to collaborative research includes any interaction or contractual relation with the private sector. Common names for such offices differ. Some examples include: Technology Licensing Office (TLO), Technology Management Office, Research Contracts and IP Services Office, Technology Transfer Interface, Industry Liaisons Office, IP and Technology Management Office, and Nucleus of Technological Innovation [WIPO-Int].

SCIENCE AND TECHNOLOGY PARKS (STP) are territories usually affiliated with a university or a research institution, which accommodate and foster the growth of companies based therein through technology transfer and open innovation [WIPO-Int].

The ***U.S. BAYH-DOLE ACT*** of 1980 allows universities and other non-profit institutions to obtain title to inventions developed from federally funded R&D provided certain obligations are met. These obligations include trying to protect (when appropriate) and commercialize the discoveries, submitting progress reports to the funding agency, giving preference to small businesses that demonstrate sufficient capability, and sharing any resulting revenues with the inventors. The Bayh-Dole Act is credited with stimulating interest in technology transfer activities and generating increased R&D, commercialization, educational opportunities, and economic development in the United States.

LICENSING AGREEMENTS are legally binding contracts where the owner of intellectual property (IP) in a valuable technology (the licensor), gives someone else (the licensee) permission to use that IP in ways (terms) that are spelled out in the agreement.

An ***ASSIGNMENT OF INTELLECTUAL PROPERTY RIGHTS*** involves the transfer of ownership of IP (patent, utility model, trademark, copyright, know-how protected by a trade secret etc.) from the owner (assignor) to the assignee (physical or legal entity) with permanent effect.

NON-DISCLOSURE AGREEMENTS (NDAs) or confidentiality agreements are legally binding agreements not to disclose confidential information that a party has learned, or not to use it for any purposes other than those specified in the agreement.

COLLABORATIVE RESEARCH AGREEMENTS – Collaboration agreements or collaborative research agreements are concluded by two or more parties that wish to cooperate to develop and possibly commercialize a new technology.

CONSULTANCY AGREEMENTS involve consultancy work by university professors and/or researchers who provide expertise services to an industry partner in exchange for payment, often on a personal basis, if allowed by the university's policy.

SPONSORED RESEARCH AGREEMENTS govern the relationship between a university or research institute and a sponsor, that may be a government body or commercial entity interested in developing scientific results in a particular area of relevance for its business.

MATERIAL TRANSFER AGREEMENTS (MTAs) govern the transfer of physical assets and tangible research materials from the provider to the recipient that intends to use them for the purpose of its own research.

CONTRACT RESEARCH AGREEMENTS are concluded when a commercial company "hires" a university or a research institute to conduct research towards a commercial goal.

ACADEMIC SPIN-OFFS (or ***spin-outs***) are newly-created companies based on a new technology developed by a university or research institution.

A ***UNIVERSITY RESEARCH-BASED START-UP*** is a company built on a university granted license for one or more technologies.

A ***JOINT VENTURE*** is a business entity created by two or more parties pooling their resources with the objective of implementing a common business purpose. It is generally characterized by shared responsibility, governance, risks and benefits.

Intellectual assets:
- Intellectual property (created, identifiable and protectable by IP laws, such as patents, trademarks, industrial design, copyrights, etc.);
- Knowledge assets (protectable and identifiable by contract, commercial or competition law - such as trade secrets, knowledge, know how, expertise, etc.).

Non-intellectual assets:
- Collections (libraries, etc.);
- Research infrastructure & capacity (laboratories, equipment and skilled people, etc.);
- Financial assets (spin-off companies, private fund managers, etc.);
- Operational assets (TTOs, KTOs, clinical trial officers, etc.);
- Strategic assets (reputation, access to patients, entrepreneurial culture, etc.).

Mapping of Intellectual Assets
Universities and research institutions often own or control different types of "academic assets" that are potentially very useful and powerful resources for initiating collaborations with other research institutions, attracting industry partners or providing useful services to public sector and society. Often these institutions are not fully aware of the existence and potential value of the assets under their control.

5.1. PROTECTION OF INTELLECTUAL PROPERTY IN MONTENEGRO - NATIONAL LEGISLATION

A ***TRADEMARK*** is a legally protected sign that serves to distinguish the goods and/or services of one natural or legal person from the same or similar goods and/or services of another natural or legal person. A trademark can be any sign (word, logo or image) that distinguishes the products and services of one company or organization from the products and services of another company or organization.

[MNE-DIP – int]: A ***TRADEMARK*** is a legally protected sign that serves to distinguish the goods or services of one natural or legal person from the same or similar goods or services of another natural or legal person. The function of a trademark is to enable consumers to distinguish the goods or services of one natural or legal person from the same or similar goods or services of another natural or legal person. The holder of the trademark has the exclusive right to use the mark protected by the trademark to mark goods or services, and also has the right to prohibit unauthorized use of the same or similar mark to mark the same or similar type of goods or services. Signs that contain a word, letter, drawing, picture, slogan, label, colour or three-dimensional shapes or combinations of the above possibilities can be protected with a trademark. A trademark can be individual or collective. An individual trademark is a legally protected sign used in traffic by the bearer, who can be a natural or legal person. A collective trademark is a trademark of a legal entity that, in addition to the trademark holder, is used by other persons authorized by the trademark holder by its general act.
A ***PATENT*** is an exclusive right granted by the state for an invention that is new, has an inventive level and is industrially applicable. A patent is a form of intellectual property that can protect an

invention that represents a new solution to a specific technical problem, while patent rights are recognized for those inventions related to a specific product, application or procedure.

[MNE-DIP – int]: A ***PATENT*** is an exclusive right granted by the state for an invention that is new, has an inventive level and is industrially applicable. In patent law, an invention is defined as a technical solution to a technical problem. The patent holder has the exclusive right to prevent or prohibit all others from using the product or offering it for sale, importing a product or procedure based on a recognized patent, without his consent. A patent in Montenegro is recognized by the Directorate for Intellectual Property of the Ministry of Economic Development and Tourism. In Montenegro, inventions are protected by a patent according to the provisions of the Law on Patents.

INDUSTRIAL DESIGN is a three-dimensional or two-dimensional appearance of the entire product, or its part. Three-dimensional design is primarily characterized by the shape of the product, such as the model of a car or furniture, the appearance of jewellery, watches, packaging, and many other products. Two-dimensional design consists of two-dimensional features such as images, patterns, patterns, ornaments, line arrangements, and the like. Also, industrial design can consist of combinations of one or more three-dimensional and two-dimensional characteristics. Industrial design represents the decorative or aesthetic characteristics of a product that is to be protected, and thus makes a certain product appealing and attractive, which leads to an increase in sales and value of that product. Industrial design law protects the external or visible characteristics of a product's appearance. This may also include certain products where the design is an integral part required for the use or use of the product.

[MNE-DIP – int]: ***INDUSTRIAL DESIGN*** is the external appearance of the product as a whole or a part of the product that results from its features, especially lines, contours, colours, shapes, textures and/or materials from which the product is made and decorated. Design is applied to a whole range of industrial or craft products: from technical instruments, fashion products, medical instruments, household products, jewellery, to electrical appliances, vehicles, textile product designs. It is also important for product packaging, packaging and special product equipment.

COPYRIGHT refers to the protection of authors' rights over their creative and original literary, scientific and artistic works. The subject of copyright protection is an author's work, and the author is a natural person who created that work. In the event that several authors participated in the creation of the author's work, then it is a co-authored work. An author's work means an original (original) intellectual achievement from the literary, artistic and scientific fields that has an individual character and is expressed (materialized) in a certain way.

[MNE-DIP – int]: ***COPYRIGHT AND RELATED RIGHTS*** – An ***AUTHOR'S WORK*** is an individual spiritual creation from the fields of literature, science and art, which is materialized in a certain way. Author's works include: spoken works, written works, computer programs, musical works with or without words, dramatic, dramatic-musical, choreographic, puppetry and pantomime works, photographic works and works created in a process similar to photography, audio-visual works, works of fine art, works of architecture, works of applied art and industrial design, cartographic works and presentations of a scientific, educational or technical nature. An unfinished author's work, parts and the title of an author's work, as well as reworkings (translations, adaptations, arrangements, changes, etc.) of author's works or other material and a collection of author's works or other material (encyclopaedias, anthologies, databases, document collections, etc.), which due to the selection or alignment or arrangement of the content may be an individual intellectual creation in the field of literature, science and art, can be considered an author's work. The author can only be a natural person, while the copyright holder can be both a natural person and a legal person. Copyright arises from the creation of the work, and not in some special process of recognition of rights by state authorities.

RIGHTS related to copyright include the rights of those persons who use other people's works in the course of their activities. These persons invest technical and financial resources, as well as their talents, in order to materialize and present author's works. Related rights do not in any way affect the protection of authors' rights with respect to their works. Types of related rights:

- Rights of performers (actors, singers, musicians, dancers, conductors, directors, etc.);
- Rights of producers of phonograms;
- Rights of film producers;
- Rights of broadcasting organizations;
- Publisher's rights;
- Rights of database manufacturers.

SEMICONDUCTOR TOPOGRAPHY protects the three-dimensional pattern, i.e. the arrangement of layers (conductive, insulating and semiconductor material) of which the semiconductor product is composed, and which are intended to perform a certain electronic function. While e.g. industrial design determines or defines the external appearance of a certain device, topography determines the exact location of each element with an electronic function within an integrated circuit.

[MNE-DIP – int]: ***TOPOGRAPHY*** is a three-dimensional arrangement of elements, at least one of which is active, and interconnections in an integrated circuit, or such a three-dimensional arrangement prepared for the production of a specific integrated circuit.

[MNE-DIP – int]: An ***INTEGRATED CIRCUIT*** is a finished product or intermediate product in which a certain electronic function is realized and in which elements, at least one of which is active, and interconnections are integrally formed in a piece of material or on a piece of material, that is, both in a piece and on a piece of material. Only topography that is the result of the creator's intellectual effort and that was not generally known among topography creators and manufacturers at the time of its creation can be protected.

MARKS OF GEOGRAPHIC ORIGIN are marks that refer to the geographical origin of products or services and that indicate that those products or services have certain quality and properties attributed to that area. Recognized designations of geographical origin strengthen the trust of end consumers (buyers) and at the same time enable them to recognize quality products more easily. For manufacturers, on the other hand, these marks enable better placement of their products on the market.

[MNE-DIP – int]: Indications of ***GEOGRAPHICAL ORIGIN*** – The name of origin is the name of a region, a specific place or, in exceptional cases, a country, which is used to designate a product: which originates from that region, that is, from that place or that country; the quality or characteristics of which are exclusively or significantly determined by the natural and human factors of a certain geographical environment AND whose production, processing and preparation take place in a certain geographical area.
A geographical indication is the name of a region, a specific place or, in exceptional cases, a country that is used to designate a product: that originates from that region, that is, from that place or that country; which has a specific quality, reputation or other characteristics attributable to its geographical origin; whose production and/or processing and/or preparation takes place in a certain geographical area.

INFORMAL FORMS OF INTELLECTUAL PROPERTY include trade secrets, protection against unfair market competition, knowledge and experience45, protection of confidential data, etc. In the European Union, this category also includes business methods.
TRADE SECRET means confidential business information that is not generally known in the relevant business circles, and at the same time has a high commercial value and ensures its owner

a competitive advantage on the market.
[MNE-DIP – int]: ***INTELLECTUAL PROPERTY*** encourages human creativity, pushing the boundaries of science and technology and enriching the world of literature and art. The very concept of intellectual property means special, specific rights that authors, inventors and other holders of intellectual property rights have. Intellectual property is not concrete, material ownership of an object, but a right or a set of powers that the legal order of the country recognizes to the holder of intellectual property rights. What these powers are and how they are exercised depends on the type of act we are protecting and the legal structure in which we are seeking protection.

Thanks to very early multilateral conventions, the field of intellectual property is one of the few branches of law that enjoys a high degree of harmonization in most legal systems. "Intellectual property" was mentioned for the first time in a preserved judgment of the district court of the American federal state of Massachusetts from 1845. The judgment is considered the first written source, which contains the term intellectual property. In the legal theory and literature of France, a year later, i.e. in 1846, the term *propriété intellectuelle* was used for the first time by Alfred Nion in his work "*Droits civils des auteurs, artistes et inventeurs*", which leads to the indication that this term was in use before. The term "intellectual property" was defined in the seventies of the last century, from the moment the Convention establishing the World Intellectual Property Organization entered into force. Article two of that convention defines intellectual property. "property" means rights related to: literary, artistic and scientific works; interpretations by artists and performers and performances by artists, phonograms and radio broadcasts; inventions in all areas of human activity; scientific discoveries; industrial samples and models; factory, trade and service marks, as well as trade names and trade names; protection against unfair competition and all other rights related to intellectual activity in industrial, scientific, literary and artistic fields areas.

Intellectual property is divided into two categories:
- industrial property, which includes inventions (patents), trademarks, industrial design, geographical indications and indications of origin, topography of integrated circuits;
- copyright and related rights, which includes works of literature, science and art. Related rights refer to the rights and structure of legal protection of artistic expression, as well as the protection of organizational, business and financial investments in the performance, production, distribution and broadcasting of author's works.

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