Interreg
Danube Transnational Programme
KnowING IPR

Fostering Innovation in the Danube Region through Knowledge Engineering and IPR Management

Output 3.1. IPR challenges map

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Executive Summary

This output identifies that the process of technological transfer and IPR support is very slow, with financial, legislative and human capital difficulties that continue to hinder and delay the commercialization of the research results and the integration of IPR in both business and academic work.

Some of the most critical issues identified in the regional analysis conducted during KnowING IPR project - country reports and workshops with relevant stakeholders - are: *lack of financing; difficult access to informational sources; frail cooperation between the research entities and private companies; weak connection of the researchers to the newest developments in the world-wide research area of interests; the absence of qualified professionals that would facilitate the connections between research institutions/ universities and the business environment; expensive and bureaucratic process for patenting and lack of awareness about IPR benefits and about existent support*. These are characteristics related to the pillars of the innovation ecosystem and these reflect the main needs underlined by the relevant stakeholders engaged in the process of research.

In addition, the national databases and expert international database assessment underlined the following key specificities: *even if the potential for patent application is highly related to the economic potential given by GDP per capita, there seems to be no particular correlation in regard to open availability of IPR data and related databases; moreover, the technology transfer databases are missing in the Danube countries; last but not least, there is a concern relating to the availability of open access business related data both in terms of national and international databases*.

The analysis showed *a limited number of IPR good practices emerging from the Danube countries, most of them being specific to the Western part of the region*. Overall, technology transfer activities appear modest at this stage, fact that is confirmed by the low level of patenting which hinders the development of the whole innovation ecosystem.

Consequently, comprehensive support schemes for IPR development at the Danube region are required and creating awareness and building capacity among the innovation actors are key starting steps to coherently engage in the development of the Danube IPR ecosystem.

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Introduction.

The current output (Output.3.1.), representing the final version of the IPR Challenges Map, provides illustrative examples of gaps in terms of IPR in the Danube region. This document addresses the challenges related to IPR in the Danube region.

The Danube IPR Challenges Map provides important inputs for the development of the KnowING IPR knowledge database and the basis for the IPR Action Plan, as well of the KnowING Hub platform. It provides in-depth background information on potential stakeholders and users, their needs in terms of IPR enriched data sources and IPR management potential, as well as on current IPR cooperation clusters and what support is available in individual countries of the Danube region.

The document is based on data collected from various sources: country reports elaborated as results of the desktop research processes, focus groups carried out with key stakeholders in the Danube countries, as well as the feedback received, both from project partners and stakeholders, during the workshops organised within the KnowING IPR project.

The authors wish to thank the regional stakeholders for their useful comments and information provided during the focus groups.

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The Danube IPR Challenges Map and the EUSDR

The socio-economic environment of the 14 states of the Danube region is picking up. The Revision of the EUSDR Action Plan (2019) notes that "although the Danube region is quite heterogeneous, in terms of macro-economic performance, relations between most parts of the region are quite strong, and the macro-regional integration on trade, investment and energy is found to be high". The report mentions that there are also a "number of new challenges emerged or further anchored on the political agenda to turn the page of the crisis". Intellectual property rights (IPR) serve as a driver for innovation and economic performance, yet they as such and their management also represent a challenging area.

The work conducted within the KnowING IPR is very much in line with what was stated by the Council of European Union on the implementation of the EU macro-regional strategies in their 2019 statement. The statement considers that macro-regional strategies should maintain a targeted and result-driven implementation with clear European added value, and defined results (p.4). At the same time it observes the need for: a)rekindling the political momentum in support of macro-regional strategies including through high-level meetings and multi-level and multi-stakeholders governance and involvement; b)increasing involvement, commitment and ownership of stakeholders and partners at local and regional level, as part of a bottom-up approach which brings an increased awareness of and a feeling of inclusion in the EU; c)making progress in the communication activities such as the development of communication strategies and organization of events and activities.

The output presented fits very much in line with stated above. It is a result of strategic inquiries and stakeholder engagements. The document solely results from stakeholder involvement and their contribution in form of focus groups and interviews participations. The approach selected by the KnowING IPR is to continue the engagement of stakeholders to try to ensure the ownership of stakeholders. Events and communication activities that are planned by the project in the future months will be in line with an attempt to ensure the ownership of stakeholders.

Following this, the KnowING IPR and its outputs will continue to contribute towards the goals of the EUSDR, especially PA 8 (competitiveness of enterprises). Additionally, the presented document, is even broader and in present shape it can also help with better understanding of other field and other Priority Areas. Especially the first part of the Output can serve as general assessment of the whole entrepreneurial ecosystem of the Region and can be applied to every field, since it touches the topics of policy, finance, market, support, human capital, culture. Assessing situation hindering cooperation on these outlined fields can contribute to better tasks implementation at PA 7 (knowledge society), PA9 (people and skills), and also 10 (institutional capacity and cooperation).

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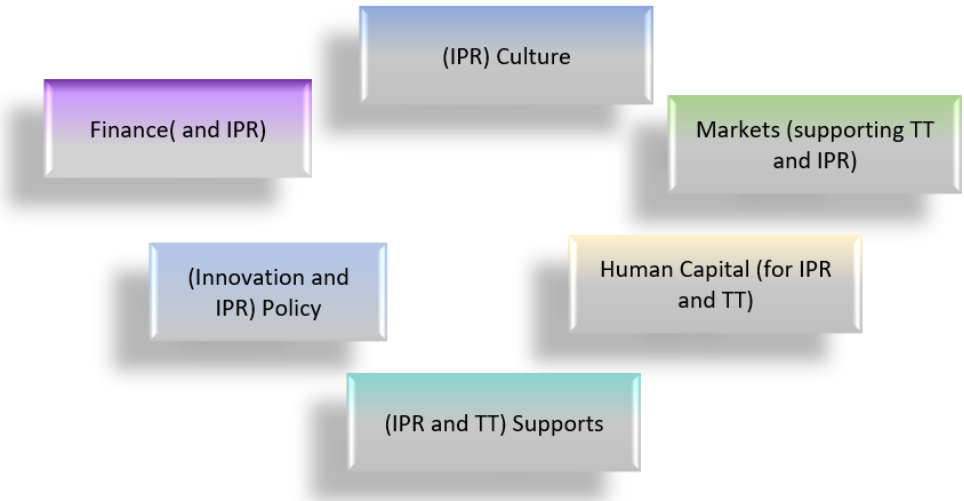
Challenges of the entrepreneurial ecosystem

Information regarding challenges related to IPR in the Danube Region countries was collected primarily through desktop research, by extracting and analysing data from individual country reports, as submitted by KnowING IPR partners. Thus, data was collected on IPR challenges in Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Germany, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine. The analysis revealed major discrepancies between the volume and quality of data contained in the report - while some reports provided in-depth and documented information on the situation of IPR in the respective countries, others offered a more general perspective of weaknesses and challenges at national level. However, since the analysis aimed at presenting challenges related to IPR not on national level, but rather at the level of the entire Danube Region, the data collected from the various country reports is very relevant.

In order to develop and maintain a practical approach which will also be used in the development of the KnowING IPR Hub, the data was structured and analysed based on pillars of the entrepreneurial ecosystem: policy, markets, support, education, finance and culture. The approach of entrepreneurial ecosystem helps us to better understand the causal relationships between IPR and the determinants of entrepreneurship which will further give data about the performance of the ecosystem and the contribution of IPR towards it.

Figure 1: Pillars used in the analysis



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Challenges related to POLICY

Overview

IPR legislation is in place in the majority of countries in the Danube Region. However, there are obvious differences between industrialised countries (Austria and Germany) where the strategic frameworks are more focused on IPR and the emergent economies / former communist countries where the availability of legislative measures is still low.

In addition, while the former have well-established and functional technology transfer offices - which act as one stop shops for all matters related to intellectual property - and have put in place support programmes to enhance the commercial development of research results and foster science-industry collaboration, the latter are still confronted with fragmented policymaking, overly complicated legislation or by weak enforcement of existing regulations.

Not each country is confronting with the same challenges, but there are a lot of similarities among the Danube States.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 1. Main challenges related to policy

Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Weak national patent systems	▪ Institutional IP regulations are still missing.	Montenegro	Partially
	▪ The system of patenting is less developed: for example in the majority of countries (particularly in former communist states), most patents / utility models are owned by foreign entities.		
Low level of awareness / knowledge of	▪ There is lack of awareness regarding the importance of obtaining	majority of countries in the Danube	Yes

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
IPR policies	protection for intellectual property. ▪ There is lack of awareness regarding the existing policy framework on IPR. ▪ There is a lack of specific advice/information with regard to the process of application for patent. ▪ The system of patenting is less developed: for example in the majority of countries (particularly in former communist states), most patents / utility models are owned by foreign entities.	region	
Slow patenting process	▪ The time required to grant a patent is lengthy (in industries where the life cycles are short): ▪ There is a significant administrative burden related to granting patents due to bureaucracy: e.g. complicated procedures, lack of standards contracts.	majority of countries in the Danube region	Yes
Lack of effective support programmes	▪ Low number of or inadequate support programmes to encourage technology transfer and science-industry cooperation.	Bulgaria, Bosnia and Herzegovina, Romania	Yes

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	▪ Ineffective implementation of the existing support programmes for IPR.	Bulgaria	
No adequate/ comprehensive legislation & enforcement	▪ There are insufficient/inadequate technology transfer mechanisms.	Czech Republic, Slovenia, Romania	Partially
	▪ The transfer of research results from universities to industry is hampered by overly complicated legislation.	Czech Republic, Ukraine	
	▪ There is weak enforcement of existing legislation.	Ukraine, Montenegro	
Fragmented / inconsistent policymaking	▪ There is a fragmented policymaking process in the areas of research, human capital development, technology development, and promotion of business innovation. ▪ There is rather a lack of coordination among governmental bodies involved in the national innovation system. ▪ There is a relative lack of a systematic approach to the development of R&D by governmental structures.	Bulgaria, Bosnia and Herzegovina, Romania	Partially
	▪ There are discrepancies among different countries in the Danube Region	majority of countries in the Danube	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	with regard to IPR legislation.	Region	
Instability of political situation	▪ There is a lack of predictability of policy framework due to unstable political situation and elections.	Ukraine, Republic of Moldova, Romania	Partially

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Challenges related to FINANCE

Overview

Financing of R&D activities is particularly difficult in transition or developing countries, where the national economy still has a modest performance. R&D spending is below the EU average in a number of countries (Romania, Serbia, Bosnia and Herzegovina etc.). Moreover, there is a lack of incentives for funding innovative entrepreneurship and commercialization of research.

These facts influence IPR in different ways, but most notably, lack of R&D activities due to low funding available, results in lower level of inventive, novel and more radical inventions, which are appropriate for patent protection. Secondly, IPR are often seen as too expensive, especially for start-ups, private inventors, and junior researchers.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 2. Main challenges related to finance

Challenges	**Specific issues**	**Country(ies) where the challenges were firstly identified[1]**	**General characteristic of the Danube region[2]**
Economy with modest performance	▪ Instability of the economic situation reigns in some countries of the Danube region. ▪ In some countries, there is a high dependency on external capital. ▪ There is a modest growth of the national economies.	Bosnia and Herzegovina, Moldova, Montenegro, Ukraine	Partially
Lack of financial	▪ There is a dependency on international	Montenegro	Yes

[1] As resulting from the focus groups and desktop research
[2] As resulting from the workshops & validation process

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified[1]	General characteristic of the Danube region[2]
resources	projects		
	▪ There is a lack of financial incentives for commercialization of research results.	majority of countries in the Danube Region	
	▪ Low level of survival of patents due to lack of resources for maintaining them (i.e. inability to bear the maintenance costs for patents).	majority of countries in the Danube Region	
Low level of R&D spending	▪ The total share of R&D spending in the national GDP is still well below the European average.	Bosnia and Herzegovina, Serbia	Partially
	▪ A small percent of budget available for R&D is allocated to technology transfer projects.	Republic of Moldova	
	▪ Private investments in R&D are small.	Bosnia and Herzegovina	
Insufficient use of EU funds	▪ There is a low absorption of the budget available through existing operational programmes.	Bulgaria	Partially

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified[1]	General characteristic of the Danube region[2]
High costs of patenting	▪ SMEs require external financial support (from public, EU or private sources) in order to patent research results.	majority of countries in the Danube region	Yes

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Challenges related to CULTURE

Overview

Awareness on the importance of IP is generally low, both among businesses as well as among universities and other research institutions. Moreover, few research institutions acknowledge the value of collaborating with the business environment and transferring the results of the research processes to the private sector. There are challenges mainly related to those Danube countries in which innovation culture remains largely underdeveloped. This in turn has led to a lack of awareness regarding the importance of IPR protection, high tolerance towards infringements of IPR, and low tolerance towards failure and risk-taking.

In research, the value of IPR is not acknowledged sufficiently. As a consequence, some of the research findings are not properly protected making them less attractive for technology transfer to private companies, as these desire stronger levels of protection garnered by IPR. HEIs should give stronger support to researchers, especially junior scientists, in protecting and exploiting their IPR.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 3. Main challenges related to culture

Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Low copyright culture and piracy	▪ There are websites created exclusively for the distribution of pirated materials - the uncontrolled use of counterfeit goods.	Ukraine, Moldova	Partially
	▪ Infringements of intellectual property rights (counterfeiting and piracy) is tolerated and even regarded as normal.	Croatia	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Lack of awareness about the potential of IPR	▪ There is lack of awareness of the importance of IP among SMEs. ▪ Companies and universities are not fully aware of the fact that R&D and innovation activities should also have a commercial aim.	Croatia, Slovakia, Hungary, Romania	Partially
Lack of awareness on the benefits of IPR information and management of IPR	▪ SMEs lack the knowledge and resources of IPR management. ▪ There is a lack of awareness of existing IPR information tools.	Romania, Bulgaria, Moldova	Partially
Risk aversion	▪ There is lack of trust among organisations: e.g. universities and SMEs or SMEs. ▪ Failure in business is stigmatized, which discourages entrepreneurs from taking risks and innovating ▪ Entrepreneurial / innovation mindset has just started to develop since it was largely discouraged prior to 1990 in former communist countries	majority of countries in the Danube Region	Yes

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Mental barriers/ negative perceptions related to IPR	▪ IPR is not perceived as important / relevant / useful.	Montenegro	Partially
	▪ Local inventors are not considering implementing the invention abroad	majority of countries in the Danube Region	
	▪ Using IPR rights is low valued.	majority of countries in the Danube Region	
	▪ IP and especially patent protection is perceived to be expensive as compared to potential benefits (which translates in few patent applications) ▪ Long IP enforcement processes have led to a negative perception of IP protection.	Croatia, Hungary	
Lack of awareness regarding science-industry cooperation and technology transfer	▪ There is lack of awareness of the importance of cooperating with technology transfer offices.	Slovenia, Romania	Yes
	▪ There is lack of information on licensing, commercialisation and investment opportunities.	Hungary, Romania	
	▪ Universities are not	Slovakia	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	interested in collaborating with the private sector		

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Challenges related to HUMAN CAPITAL

Overview

The majority of the analysed countries are confronted with a lack of specialists in IPR. Moreover, particularly in transitioning countries, there is a lack of collaboration between IPR and TT representatives, and only a small number of researchers are engaged in the private sector. In addition, the Danube countries lack a corps of experts in technology transfer.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 4. Main challenges related to human capital

Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Lack of expertise / knowledge in IPR	▪ There is a lack of knowledge on how to prepare patent applications.	majority of countries in the Danube Region	Yes
	▪ Companies do not have their own specialists in IPR.	Czech Republic	
	▪ There are different levels of professional competences among the staff in technology transfer offices, which leads to variations in the quality of services offered. ▪ There is a lack of practical experience of technology transfer experts.	Slovenia, Romania	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	▪ There is a lack of reward schemes for developing expertise.	majority of countries in the Danube Region	
	▪ SMEs lack the knowledge and awareness to recognise the importance of IPR and IP Management.	Hungary	
	▪ Lack of knowledge on IPR among entrepreneurs, which hinders them from developing a strategic approach for IPR.	Croatia	
	▪ Education is not conducive to entrepreneurship and innovation.	Romania, Bulgaria, Moldova, Montenegro	
Low level of collaboration among stakeholders	▪ There is a lack of collaboration between IPR and TT representatives	Montenegro	Yes
	▪ There is a need to simplify searching for university-based cooperation partners in order to ensure a faster initiation/implementation of projects.	Austria	
	▪ Industry representatives and researchers from public organisations have different interests / agendas.	majority of countries in the Danube Region	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Outdated educational curricula	▪ The needs of the industry are not reflected in the educational curricula.	Bosnia and Herzegovina	Partially
	▪ The current curricula does not encourage an innovation/entrepreneurial culture.	majority of countries in the Danube Region	
Low number of researchers in private sector	▪ The number of researchers engaged in the private sector is small.	Serbia	Partially
Inadequate IPR policies in universities / public research institutions	▪ There is a lack of motivation and practical experience of university lecturers / professors. ▪ There is a need to adjust academic evaluation systems, since a large number of researchers apply for patents only to obtain higher scores. This in turn leads to a high number of "shelf patents" ▪ There is a lack of motivation, organisational support and incentives for patent applications that respond to real market needs.	majority of countries in the Danube Region	Yes

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Challenges related to MARKETS

Overview

A recurring problem in the majority of countries in the Danube Region is the small number of patent applications, coupled with the fact that the majority of patents are internationally owned (foreign applicants). In emergent economies / transitioning countries, large companies tend to conduct their R&D activities elsewhere. On the other hand, in economically developed countries (Germany, Austria), a large number of patents are "shelf patents" - i.e. are not used for commercial purposes, but either to prevent competitors from using a given technology or to improve the results of academic evaluations.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 5. Main challenges related to markets

Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Market fragmentation	▪ The market is fragmented into numerous segments of different sizes, and players have different leveraging power (playing field is not equal). ▪ The matchmaking tools are underdeveloped.	majority of countries in the Danube Region	Yes
Small number of new patents per year	▪ Only a small number of patent applications (around 5%) are actually used.	Hungary	Partially
	▪ While the number of	Romania	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	patent applications by residents slowly increased, the number of patent granted to residents registered a decline (from 600 in 2008 to 409 in 2017).		
The use of patents on foreign markets and the use of patents by foreign entities	▪ Large multinational companies generally conduct their R&D activities elsewhere.	Hungary, Slovakia	Partially
	▪ There is a small number of international patents.	Croatia, Romania	
Lack of market orientated research	▪ Researchers are less focused on putting their work into practice, but rather on obtaining positive results at academic evaluations. ▪ More than 50% patents will not be ever used.	Czech Republic	Yes
	▪ Research centres and the universities lost connection with cutting-edge technological innovations.	Bulgaria	
	▪ Scientific evaluation system is oriented towards basic research. If this would change, universities could be involved more in applied	Hungary	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	research, which could intensify the cooperation with the industry.		
Low transferability of research results	▪ Many applications are abandoned before obtaining protection. ▪ Patents are filed by persons/entities that do not have a clear vision on how to commercialise them.	Croatia	Yes
	▪ Around one quarter of all patents are not used for economic purposes; about half of the unused patents can be classified as "blocking patents", which are solely used for preventing competitors from using a given technology	Germany	
	▪ Although some universities operate technology transfer centres and/or offices, science-industry cooperation remains low and technologies developed by research institutions are rarely transferred to the private environment and even less frequently to SMEs.	Romania	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	▪ There is a very limited evidence of academic spin-offs from universities.		
Low contribution to the global production of scientific papers	▪ The citation of domestic works lags behind the European average	Serbia	Partially
Lack of/low number of patents applied for by women	▪ Patents applied by universities do not list women as inventors (neither in companies, nor in universities).	Austria	Yes

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Challenges related to SUPPORTS

Overview

We explored supports particularly in relation to technology transfer as some issues in regard to IPR were already addressed under the previous chapter.

Overall, the transfer of research results is still difficult in the majority of analysed countries. In some cases, technology transfer offices are partially functional (e.g. Montenegro) and transfer mechanisms are not always clear. Other factors hampering technology transfer are lack of information and underdeveloped infrastructure.

The table below presents the challenges as well as the country/ies where these were firstly identified as resulting from the focus groups and desktop research (column three) and if these represent a general characteristic of the Danube region as resulting from the workshops & validation process (column four).

Table 6. Main challenges related to supports

Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
Lack of comprehensive framework for tech transfer	▪ The transfer of research results into practice is still poorly organized. ▪ The transfer of results from universities to industry is hampered by the immaturity of technology and complicated legislation.	Czech Republic	Partially
	▪ The investment in innovation infrastructure is unexplored: there is a need to invest in human skills for tech transfer to capitalise on the investment in infrastructure realised in	Romania	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
	the current programming period (2014-2020).		
	▪ Universities are still developing their innovation ecosystem ▪ There are tech transfer offices established in the universities, but there are no dedicated employees.	Montenegro	
Lack/low access to professional legal advice	▪ The firms do not have their own specialists in IP law.	Czech Republic	Yes
	▪ There is a lack of programmes for supporting the implementation of the patents results.	Moldova	
Low availability of information	▪ There is an absence of information support activities.	Ukraine	Yes
	▪ IPR is not approached in topics related to innovation in the academic debates.	Ukraine	
	▪ The existing information tools are not properly disseminated.	Hungary	
	▪ There is a limited information about technology transfer process.	Austria, Romania	

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Challenges	Specific issues	Country(ies) where the challenges were firstly identified	General characteristic of the Danube region
No appropriate infrastructure	▪ There is an undeveloped TT infrastructure.	Montenegro	Partially
	▪ There is low promotion of IPR and high technologies for absorbing innovations.	Moldova	
Not all scientific topics benefit from support for tech transfer	▪ There are discrepancies in the manner in which science, maths and engineering areas, on one hand, and humanities, social and cultural sciences and art, in the other hand, are exploited.	Austria	Yes

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Challenges mapped by stakeholders

Table 11: Overview of challenges related to various categories of stakeholders	
Categories of stakeholders	**Challenges**
Public authorities	▪ Trust issues ▪ Lack of a common IPR strategy in Danube region ▪ The level of awareness on IPR is rather low ▪ Need for education on IPR ▪ Lack of transparency and trust at the system level ▪ Administrative issues and bureaucracy ▪ Lack of skills for IPR
Research/Academia	▪ Long time to obtain patent protection ▪ Obtaining patent protection is costly ▪ Trust issues connected to their dealings with the SMEs ▪ Underdeveloped matchmaking tools ▪ The level of awareness on IPR is rather low ▪ Need for education on IPR ▪ Fear of patenting (fear of breach of confidentiality (i.e. to have the idea stolen) ▪ Lack of incentives and supportive schemes ▪ Lack of harmonization of interests between research and industry ▪ Lack of motivation for preparing applications ▪ Low connection between fundamental and practical education and research ▪ No IPR policies in the universities to support investors
Companies	▪ Obtaining patent protection is a lengthy process ▪ Obtaining patent protection is costly ▪ Market asymmetry between big and small companies ▪ Trust issues ▪ Underdeveloped matchmaking tools ▪ Need for external financial support ▪ The level of awareness on IPR is rather low ▪ Need for education on IPR ▪ Lack of knowledge on the process to apply ▪ Expertise in terms of IPR is expensive ▪ Lack of incentives and supportive schemes

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	▪ Lack of harmonization of interests between research and industry ▪ Failure in business is stigmatized ▪ Difficulty in identifying the sources of advice for their business needs
Non-governmental/ business support organisations	▪ The level of awareness on IPR is rather low ▪ Need for education on IPR ▪ Companies cannot afford to cover the costs for expertise offered by the support organisation

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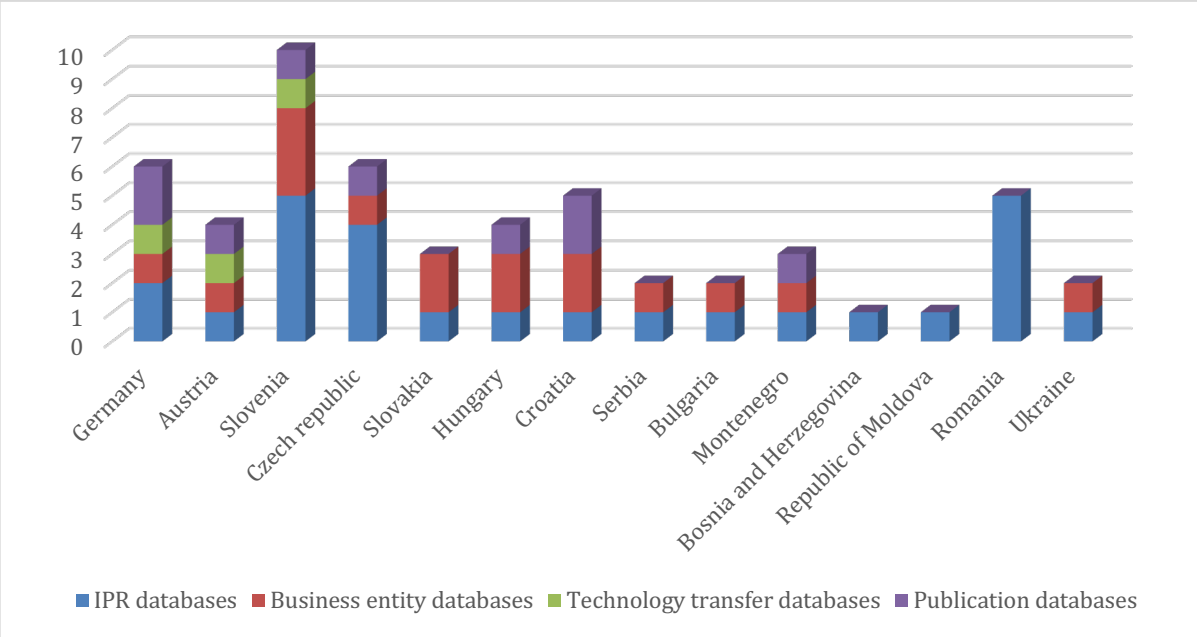
Challenges of the IP databases

This chapter addresses challenges related to the national databases on patents, scientific publications, business entity databases and technology transfer databases.

Figure 5: Types of analysed data collections



These databases have evolved over the last decade providing various services and functionalities. The structure and the number of databases differ from country to country.

From the country-specific analyses, we could identify most frequent issues faced related to national databases[3].

General summary of the identified challenges in connection to IP and IP-related databases:

- The databases typically provide only one type of data (e.g. only data on IPR, or on business entities). There is hardly any evidence on inter-linking of different types of data (e.g. linking patent data)

[3] The results are also reliant on the data collection approach, whereas the following issues can be identified: a) somewhat different approaches used in the countries make comparison and analysis more difficult; b) the results depend on the country approach on data evidence or project partner effort on understanding and collecting the data. Due to this also additional effort have been made and advanced information was sought from selected partners to compliment the data, yet these issues remain relevant.

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- Lack of data bulk download – this is a crucial functionality for pre-processing of the date or advanced analytics. There is also missing information on available download data format.
- The availability of data in English is surprisingly high, with the average of 2/3 being available in English; however more of the less developed countries pay less attention to this (e.g. Romania or Ukraine).
- Lack of Technology Transfer (TT) databases – only some of the countries – e.g. Slovenia and Austria, provided information on the TT database availability.
- Business (entities) data is mostly behind paywalls or is available only in limited format and/or is limited in scope.
- The national databases are mostly provided by public entities; the majority of them by the national intellectual property offices.
- Data fragmentation – some countries have provided higher number of databases, but the same type of databases or databases that cover the same types of data. The challenge is not only relevant due to analysis purposes. Users also may struggle to understand which data is provided by which database. Moreover, if there are overlaps the issues relating to assessing validity of data is prominent.

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Country-specific challenges

Austria

There are four databases recognized as the main source of IP data. The general availability and quality of data about IPR are good and clearly presented. There are two TT databases, but with the limited information.

Strengths:	Challenges:
• Data quality • National databases linked to the worldwide databases	• Limited information about TT • Business data behind paywall

Germany

There are six databases recognized as the main source of IP data. The average data availability is high, with just some limitations in form of fees or registrations. Despite the fact that data are not fully available, their quality is one of the best. All databases are available in English.

Strengths:	Challenges:
• Data quality • Data in English	• Data availability - fees are applied for full availability of data

Romania

There are five databases in Romania, only 40% of them are available in English. However, Romania is only one country where all the databases have the function of bulk download what makes processing of data more easy.

Strengths:	Challenges:
• Data quality • Data in English • Bulk download	• Data availability • Missing Technology Transfer databases

Slovenia

There are as many as ten databases, what makes a bit complicated for users to put all the relevant data together. Five of them are related to IPR, three to Business registry and one to Technology Transfer and Publication data. Slovenia is the only country that has Technology Transfer database available.

When we look at the quality of databases, 80% are available in English, 30% have the option for bulk download and most of databases are free with high data quality.

Strengths:	Challenges:
• Data quality • Data in English	• Data availability • Bulk download • High number of databases

Czech Republic

There are six databases available (4 of them related to IPR), 83% of them available also in English and the half of them have the option for bulk download. Almost all of the databases are free and

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with high data quality. Putting this all together, Czech Republic has available high quality data and databases accessible almost without any limitations.

Strengths:	Challenges:
• Data quality • Data availability • Data in English	• Missing Technology Transfer databases

Slovakia

There are all four databases available in English, almost all data are free and their quality is very high.

Strengths:	Challenges:
• Data quality • Data availability • Data in English	• Bulk download • Missing Technology Transfer databases

Hungary

There are five databases in Hungary. The 60% of those databases is available also in English and only one of them have option for bulk download. However, all the databases are free and quality of their data is high.

Strengths:	Challenges:
• Data quality • Data availability	• Missing Technology Transfer databases

Croatia

There are five databases. Two of them are available also in English, but none of them has function for bulk download. However, all the databases are free and quality of their data is as high as 3,75 (4,00 is the highest number – the best).

Strengths:	Challenges:
• Data quality • Data availability	• Missing Technology Transfer databases •

Serbia

Serbia has two databases, one related to IPR and one to Business registry. Both databases are available also in English and are free to access with high data quality.

Strengths:	Challenges:
• Data quality • Data availability	• Bulk download • Missing Technology Transfer databases

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Bulgaria

Bulgaria has two databases, one related to Business registry and one to IPR. The data quality of both databases is rather high.

Strengths:	Challenges:
• Data quality • The common database for various IP types	• Bulk availability • Missing Technology Transfer databases

Montenegro

There are three databases; one of them is available in English. All databases are free to access with data quality of little above the average. When comparing data quality of Montenegro databases with the other countries, data quality of Montenegro databases is under the average.

Strengths:	Challenges:
• Data availability	• Data quality • Bulk availability • Missing Technology Transfer databases

Bosnia and Herzegovina

Bosnia and Herzegovina has only one database related to IPR and it is available in English. The availability of this database is not free though and has some limitations. Data quality is not known.

Strengths:	Challenges:
• Data in English	• Data availability • Data quality is not known • Bulk download • Missing Technology Transfer databases

Republic of Moldova

Republic of Moldova has only 1 database related to IPR and it is available in English. Database is free to access with very high data quality.

Strengths:	Challenges:
• Data quality • Data availability • The common database for industrial and scientific IP results - AGEPI DATABASES	• Bulk download • Missing Technology Transfer databases

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Ukraine

Ten databases for Ukraine were initially reported; 9 of them related to IPR. However, most are connected to the same publisher, so we are in the end dealing with one type of IPR databases (containing different IPR data) and a business entity database. From all the databases, only two are available in English. All of them have high data quality and are free to access.

Strengths:	Challenges:
• Data availability	• Low level of data in English • Missing Technology Transfer databases

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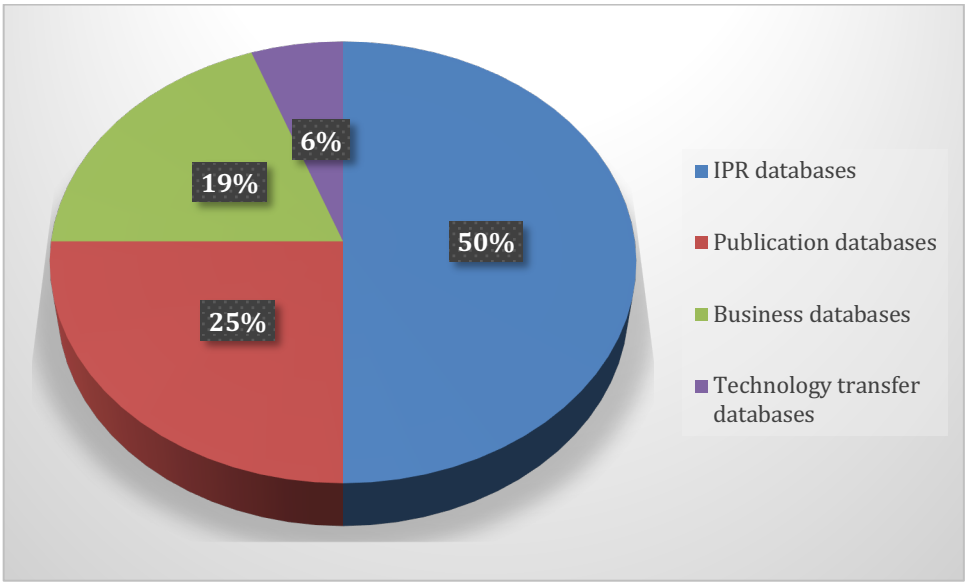
Challenges related to the international databases

This chapter addresses challenges related to the major international databases - IPR databases, scientific publication databases, business entity databases and technology transfer databases.

Figure: Considered databases by collection types



Databases were prioritized from most relevant (A) to least relevant (D). 34% of these 36 were considered of priority A and the rest were equally distributed (at 22% each). Please see appendix for more.

Quality of the data and data coverage

- The coverage and quality of databases is one of the major challenges in conducting searches on both free and commercial databases. There is no single database that has complete coverage of all documents. Thus, the users have to access various national or international databases.
- Free online databases/tools does not guarantee the accuracy or completeness of the information, nor accept any obligation for errors or omissions or their consequences though.
- Free online databases/tools are often missing data, which can affect the accuracy of the research. It takes a while to update their databases. Thus, results should be processed and verified by carrying out proportional study from other sources before making any conclusions.
- Lack of technology transfer databases to some degree perseveres on the level of international databases as well, as previously discovered for the national database level.

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- The commercial patent databases have access to many analytical tools but are rather expensive.
- Lack of integration among various databases both nationally or internationally. For non-aligned databases, better integration would allow users to be alternatively re-directed to relevant database by clicking on a given subject or a document.

Search functionalities

- Limited search functionalities – limited availability to filter the results; the maximum search terms per field are limited
- Search interface names can differ quite substantially in different databases and in some cases can confuse the users
- Syntax of patent publication numbers is not always the same and can differ from database to database. It causes the problems in retrieving information using patent number search
- Reading through the documents – even though the results can be narrow down with correct keywords, the documents still need to be read by human being

Advanced technological challenges

- More effective AI adoption. The searches (e.g. prior art) should be more intuitive so that there is no need to strike the exact search, in order to get possibly hidden results.
- More effective searches within the specific elements (e.g. images) – similar to the Google Images search.

Data export

- Limited number of exportable records and fields allowed. This is highly beneficial when a user wants to use the data for further statistical analysis.
- Limited possibility to export additional elements e.g. images

General web functionalities

- The absence of user management. The users cannot save their results and possibly come back to them after some time.
- The lack of responsive design. It prevents from using the online database from the mobile devices and tablets.

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Conclusions

The results of the analysis conducted so far show that the level of IPR development in the Danube region is modest. While IPR development has been hampered by political instability, slow economic growth and the cultural background of many countries in the region (i.e. former communist countries), the situation is slowly changing. Still, challenges faced by stakeholders are numerous and diverse, covering all the six pillars of the entrepreneurial ecosystem (policy, finance, culture, human capital, markets, supports).

The portrait of the business stakeholders conducting innovation activities in the Danube region reflects a mix of lack of awareness on how they take benefits of IPR and how they can obtain support to integrate it in their daily operations in order to grow their businesses.

In summary, the development of intellectual property rights in the Danube region is gaining critical acclaim, but the region navigates an environment full of political, cultural, educational and economic sensitivities due to specific backgrounds and transformation processes, rooted in the diverse dynamic of its countries. Thus, exploration of new capabilities and IPR development patterns as well as the reconsideration of the cooperation strategies and networks between the stakeholders in the Danube countries, both at home and at interregional levels, are required. Indeed, according to the stakeholders' opinion, the importance of intellectual property rights for industrial R&D is widely acknowledged. Nonetheless, we need to develop new mechanism, educational support and tools that allow in particular to exploit the IPR to their full potential in all parts of the Danube region, also while navigating new networking and matchmaking opportunities for intellectual property rights (IPR) and technology transfer (TT).

Beyond the dichotomy of top-down or bottom-up approaches, a diverse mix of policies and other soft instruments could be deployed for improving the IPR situation in the region. Last but not least, increasing level of awareness on IPR importance is needed also to prevent the other side of the coin: avoiding the situation when IPR is used against the innovator[4].

Overall, the results point out important insights with regard to the challenges faced by the various stakeholders in the Danube Region in terms of IPR. The problems are mainly related to the undercapitalization of the intellectual assets due to lack of a right mix between knowledge and skills and policy and administrative strategies.

[4] Ignacio de Leon, Jose Fernandez Donoso, Innovation, Startups and Intellectual Property Management. Strategies and Evidence from Latin America and other Regions, p. ix

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Limitations

The research conducted was exploratory, since the methods used (desktop research, focus groups) were largely qualitative. Although a quantification of results was performed, it was based on the results of the focus groups, reflecting the perception of a limited number of stakeholders, which is not statistically representative for the whole population. Moreover, the focus groups were performed in each country by a different team, which means that the results might have been influenced by the moderators and/or external factors, despite having used the same instrument (interview/focus-group guide).

Having performed a predominantly qualitative research, it is natural that the results are influenced by the background, attitudes and assumptions of respondents. For example, in Germany, the scores computed following the analysis of stakeholders' perception reflect a different image than that illustrated by the desktop research (the average score per country is quite low, although the desktop research shows that Germany is among the most advanced countries in terms of IPR application and management). This leads us to believe that respondents use a different benchmark system when referring to the development of IPR.

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