# GENERAL ASPECTS OF TECHNOLOGY TRANSFER AT THE REGIONAL LEVEL IN ROMANIA

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**ABSTRACT:** *This work provides an overview on transfer technological in regions Romania, analyzing role universities, research institutes and infrastructure ReNITT. They are highlighted differences regional regarding performance in patent and level of collaboration from academia, industry and government.*

**KEY WORDS:** technological transfer, IPR protection systems

## 1. INTRODUCTION

Transferring technological plays a role important in innovation, competitiveness, but and development regional and national. Lately there has been a particular emphasis on innovation and technological transfer, and this something is possible observe from the policies led by the Union European, here can underlines ,,Strategic evaluation of the technology transfer and IPR protection systems of Bulgaria, Croatia and Romania and recommendations for their enhancement,, [1]. Also at the level creep ours was implemented Strategist National Research, Innovation and Specialization Smart 2022-2027, [2]. In order to be able talk about technology transfer is necessary saddle we in discussion maturity level of results research, patent applications and patents applications. Many discoveries scientifically I remain in laboratory without being used commercial. The transfer technological helps to: transform inventions in products and useful services; finding some partner industrially for development and production; reduction gap from research and market ("valley of death"). Romania try saddle follow and saddle wall EU recommendations in this domain?

## 2. DEFINITIONS OF TECHNOLOGY TRANSFER

In specialized literature , but and at the level organizations regarding property intellectual find definitions transfer technological:

WIPO defines transfer technological like this: "Knowledge and technology transfer (K&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. K&TT serves to transform inventions and scientific outputs into new products and services that benefit society.,, [3].

The Organization for Economic Co-operation and Development- OECD defines: " Transfer technology takes place then When knowledge required for production, application or improving of a technologies are transmitted and absorbed by another user.” [4].

Rogers, EM; Shoemaker, FF specify: "Transfer technological represents the process through which innovations are communicated by some channels , along of time, between members a social system .”[5]

Bozeman., B defined thus: "the transfer technological is movement technology from an organizational context in another, accompanied by the transformation and practice its in a new environment .” [6].

Kremic, T. says that: " The transfer technological is the process in which a

technology goes from developer to user, including adaptation activities, learning and integration in the processes existing .” [7]

Regarding NASA, it does not give a " definition" unique " very" simple transfer technologically , but NASA describes the process and the concept very clear on her website official : "The NASA Technology Transfer program ensures that innovations developed for exploration and discovery are broadly available to the public, maximizing the benefit to the Nation." [8]. NASA believes Technology Transfer as a mechanism through which technologies developed internally ( for missions space, research, etc.) arrive in section commercial, private or other institutions, thus that society saddle benefit from them. The transfer technological at NASA represents the process through which technologies, inventions, software and knowledge developed internally by the agency are identified (through "New Technology" reports), evaluated and made available external entities (companies, universities, governments) through licensing, partnerships or other agreements , so that to be capitalized commercial or applied in non- spatial contexts, contributing to public and economic benefit.

## 3. CONSECRATED MODELS

From the models ESTABLISHED regarding polite and technology transfer strategies CAN we emphasize: *Open Innovation (OI)* and *Triple Helix ( TH)* which differentiates itself from the models linearity classic innovation models, such as "technology push" and "demand pull". In place of a visions unidirectional between offer and request, these models emphasize interactions complex, continuous feedback and co- evolution processes.

The Triple Helix model started from the understanding dealings institutional from universities, industry and government, represented either as a triangle or as circles partial superimposed, fig.1. In the intersection areas, concrete forms of collaboration emerge: financing Research university, transfer technological or programmer policy national. However, these relations institutional are often rigid. In an economy knowledge - based, companies – including those in the fields intensive technological such as industry pharmaceutical – choose partner academics globally , pursuing functionality and value collaboration , not just proximity national. To have a vision clear of the Triple Helix model , this presents itself in figure 1 [9].

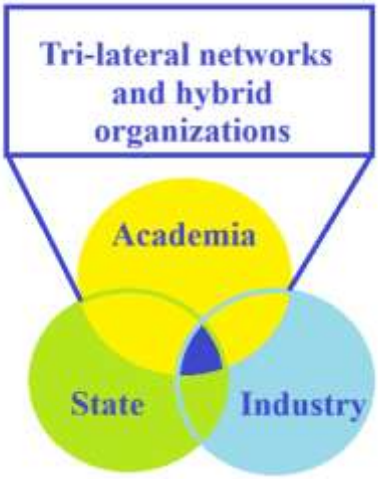


**Fig. 1. Triple helix thesis [9].**

Triple Helix (industry – academia – state) functions as a structure dynamic, similar to ADN, in which each actor fulfills roles different: industry produces, academia creates knowledge, and state ensure stability relationships. Their interactions stimulate learning regional and regeneration communities [9].

## 4. EVALUATION STRATEGY SUMMARY

Making a synthesis a ,,Strategic evaluation of the technology transfer and IPR protection systems of Bulgaria, Croatia and Romania and recommendations for their enhancement,, can underscore the fact that in Romania:

a. transferring technological is underdeveloped , the capacity to capitalize on research university is often limited — many university public do not have offices strong or efficient technology transfer (TT). Local industry does not invest ever massive in research and development (R&D), which

which reduces the reasons for cooperation between university and companies for development of technologies. Here can specifications the fact that most SMES do not have design offices and research, and business old and they closed them or personnel design offices is silly paid.

b. The role of government - Government maybe offer funding for research ( through programmer national , EU funds , etc.), but often exist malfunction in how these financings supports and "marketing / technology transfer links ".

Protection property Intellectual property (IPR) can be a poorly developed area or universities have neither resources and any experience needed let him managing efficient patents or patent applications .

c. Lack collaborative culture - there is a distance growing between academia and industrial environment : universities can be more oriented towards publications and research fundamental than to innovation applied. Romanian industry (especially companies small and middle - aged ) seems unwilling saddle investing in research or saddle collaborate with universities because risks, costs and the lack a clear benefit model. Many of the companies I don't know and I don't understand what the benefits are TAX watching adoption of the NACE secondary on the research side, respectively research activity.

d. Administrative capacity limited - some universities do not have specialized staff (transfer managers, IPR experts ) who mediation the relationship between researcher and companies. Even if exist those technology transfer centers, they don't exist experts with experience in these areas regarding innovation, transfer technological or IPR, most of them being beginners, having knowledge and experience limited. Also, licensing transactions or Partnerships technological can be cumbersome , because bureaucracy or lack of experience legal / contractual.

The relationship from universities , industry and government in Romania (in Background transfer technological ) is in continuation in development and it is not fully mature. There is barriers significant (financial, cultural, administrative), but and timely big : if these barriers are addressed strategically, Romania maybe grow much capacity its innovation and commercialization of research.

## 5. CONTEXT ANALYSIS – NATIONAL/REGIONAL SITUATION: TT CENTERS, CLUSTERS, INCUBATORS.

In the SV Oltenia region, there are 3 state universities: University of Craiova, University of Medicine and Pharmacy in Craiova, Constantin Brancusi University in Tg-Jiu, and 3 research institutes: Institute National Research and-Development for Technology Cryogenics and Isotopic – ICSI and Institute National Research and -Development for Ecology Industrial – ECOIND ( branch) Râmnicu-Vâlcea ) and Institute National Research and Development- test for Electrical Engineering – ICMET (Craiova, Dolj). In what looks technology transfer centers and business incubators accredited ReNITT, in this region exist two business incubators and 2 technology transfer centers, presented in the table extracted from the Register entity accredited from the innovation infrastructure and technology transfer (RENITT) [11].

**Table 1. Entities ReNITT in SW Oltenia Region**

| | | | |
|---|---|---|---|
| Incubator Technological and Business – ITA – ICSI Râmnicu-Vâlcea | Technology Incubator and Business ( ITA ) | Energy, Environment and change climate, Engineering industrially and transport, Agriculture and industry food | Without personality legal , Incorporated in THE INSTITUTE National Research and Development for TECHNOLOGY Cryogenics and Isotopic – ICSI Râmnicu-Vâlcea |

| | | | |
|---|---|---|---|
| Incubator Technological and Business IPA CIFATT – ITA CRAIOVA | Technological incubator and business ( ITA ) | Economy digital and TECHNOLOGY space , Bioeconomy , Energy and mobility | Without personality legal , Incorporated in within IPA SA Bucharest IPA branch – Incubation Center , training ENTREPRENEURSHIP and technology transfer CIFATT |
| CTT-UCB Technology Transfer Center | Technology transfer center | Materials function advanced , Economics digital and TECHNOLOGY spatial , Bioeconomy | Without personality legal , Incorporated in THE "Constantin Brancusi " University in Targu Jiu |
| Technology Transfer Center – CTT UMFCv | Technology transfer center | Health-prevention , Diagnosis and treatment advanced | Without personality legal , Incorporated in THE University of Medicine and Pharmacy Craiova |

At the national level there is registered , in the Register entity accredited from the innovation infrastructure and technological transfer (RENITT), 49 entities .

## 6. METHODOLOGY REGARDING STATISTICAL ANALYSIS OF PATENTS AT THE LEVEL OF UNIVERSITIES IN ROMANIA

On the website of the State Office for Inventions and Brands, there is a statistic regarding number of patents TO in the last calendar years : 2023 and 2024, from where it can be notice that in first place is University " Gheorghe Asachi" Technical Institute from Iasi with 19 patents, followed by 3 universities largest in the country : University of Science and Technology Polytechnic Bucharest, University Technology from Cluj-Napoca and University Transylvania from Brașov [12].

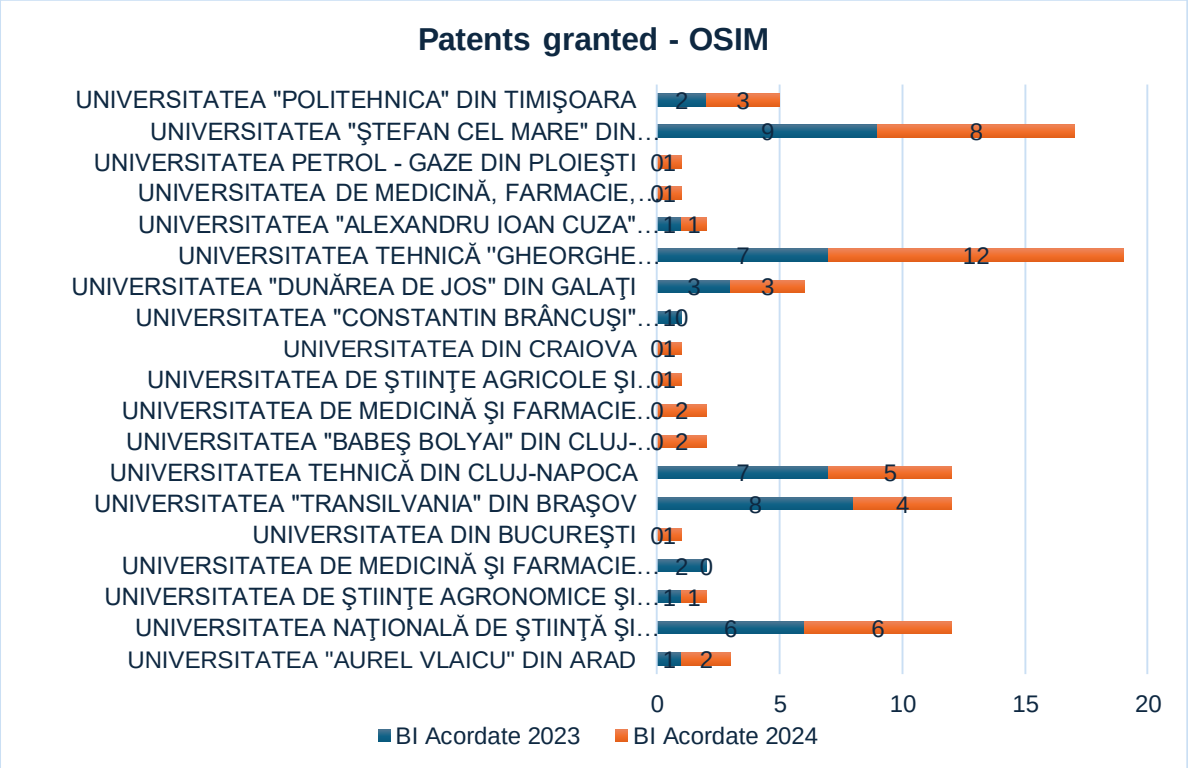


**Fig.3. Patents granted by OSIM in 2023 and 2024 [12].**

If we analyze the number of patents by region according to OSIM data , during the period in the years 2023 and 2024 we have following situation:

1. W REGION: "Vasile Goldiș "Western University of Arad; "Aurel Vlaicu" University of Arad; West University of Timișoara; "Politehnica" Univ. of Timișoara; University of Medicine and "Victor Babeș" Pharmacy in Timișoara; University of Sciences the Life of "King Michael I" from Timișoara; "Eftimie Murgu" University of Reșița.
2. NW REGION: University Technical University of Cluj-Napoca, "Babeș-Bolyai" University of Cluj-Napoca, University of Medicine and "Iuliu Hațieganu " Pharmacy Cluj-Napoca, University of Agricultural Sciences and Medicine Veterinary Cluj-Napoca, Foundation Sapientia – University Sapientia , North University of Baia Mare, University of Oradea.
3. CENTRAL REGION: "Transilvania" University of Brașov; "Lucian Blaga" University of Sibiu; Academy of Forces "Nicolae Bălcescu" Land, "Petru Maior" University of Târgu Mureș; University of Medicine, Pharmacy, Sciences and "George Emil Palade" Technology Târgu Mureș.
4. N. REGION: University "Gheorghe Asachi" Technical University in Iași; "Alexandru Ioan Cuza" University in Iași; University of Agricultural Sciences and Medicine "Ion Ionescu de la Brad" Veterinary School, Iași; University of Medicine and "Grigore T. Popa" Pharmacy in Iași; Apollonia University in Iași; "Vasile Alecsandri " University in Bacău; "Ștefan cel Mare" University in Suceava.
5. SE REGION: "Ovidius" University of Constanța; "Lower Danube" University of Galați.
6. SV OLTENIA REGION: University of Craiova; University of Medicine and Pharmacy in Craiova; "Constantin Brâncuși " University of Târgu Jiu.
7. S. MUNTENIA REGION: University of Pitesti; University of Oil and Gas of Ploiesti; "Valahia" University of Targoviște.
8. BUCHAREST-ILFOV REGION: University Polytechnic of Bucharest; University of Sciences AGRICULTURAL and Medicine Veterinary University of Bucharest; University of Medicine and "Carol Davila" Pharmacy Bucharest; University of Bucharest; University Construction Technology Bucharest; Titu Maiorescu University; Technical Academy Military; Romanian Academy of Scientists.

Taking statistics account presented by OSIM we can saddle we make a statistic by region regarding patenting at the national level, but bearing patent account obtained only by universities.

**Table 2. Number of invention patents by region recalling taking into account OSIM data**

| Regions | Patents 2023 | Patents 2024 |
|---|---|---|
| W. Region | 3 | 5 |
| Bucharest-Ilfov Region | 9 | 8 |
| NW Region | 7 | 10 |
| E Region | 3 | 3 |
| S Muntenia Region | 0 | 1 |
| SW Oltenia Region | 1 | 1 |
| NE Region | 17 | 21 |
| Region Center | 8 | 5 |

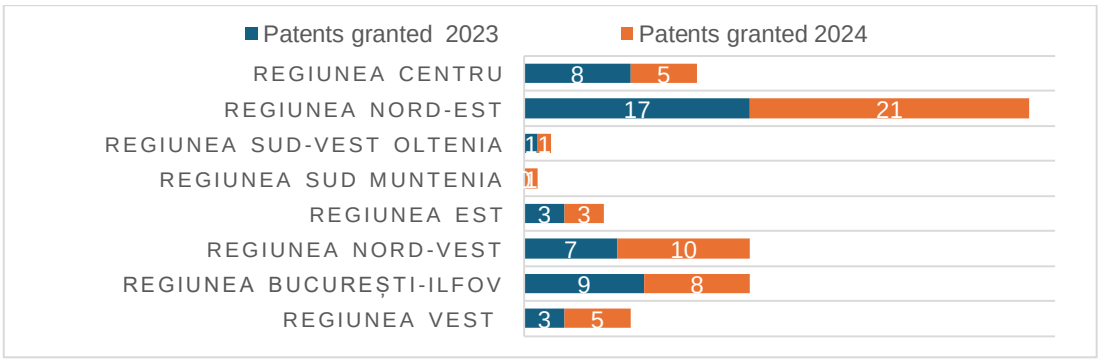


**Fig.3. Patents granted by OSIM in 2023 and 2024 at regional level, by universities.**

Transferring technological represents a multidimensional process that covers entire innovation cycle, from generation idea and protection property intellectual, up to the production and marketing results scientific. This process assume collaboration of a network extended by actors, including authority public, educational institutions and research, business environment, technology providers, brokers and innovation infrastructure entities, such as parks scientific, parks technological, business incubators and investors.

From the analysis current volume of patents essential data is missing regarding number of requests submitted by research institutions at the national level national, as well as number patent obtained by businesses, associations or people physical. The absence these information makes it difficult evaluation real innovation capacity of Romania.

To determine in What measure Romania follows recommendation Union Europeans in field innovation and transfer technologically, it is research needed in - depth relationship from academia and environment private. Analysis of these connections – including research collaborations, projects common, technology transfer mechanisms and involvement companies in recovery results scientific – represents a key indicator of alignment with the objectives Europeans regarding economy based on knowledge.

## 7. CONCLUSIONS

Analysis of the technology transfer system and innovation capacity in Romania – achieved by reporting to structures existing, to the performances in patent matters, as well as data from evaluations international – highlights a set of challenges structural, but and timely considerable development.

Current level of transfer technological remain underdeveloped.

In despite existence some university performances and research institutes with results recognized, the process of capitalizing on the results scientifically is weak. Many universities have technology transfer centers only formally, without specialized personnel, without tools operational and without a strategy coherent marketing strategy. SMEs in Romania – the main potential beneficiaries of innovation – they do not have internal research structures and are rare partners of the academic environment.

mechanisms government support is insufficient adapter for Marketing. Financing public research focused mainly on activities scientific, not on technology transfer or on prototyping. Lack some incentives tax clear and lack some programs dedicated to collaboration university – company limited the impact research. Also, management property intellectual remains weak in many institutions, what leads to underutilization patent and at the loss some timely economic.

The lack of a culture of cooperation between academia and environment private persist. Universities remain priority oriented to research fundamental and publications, and companies – especially SMEs – are reluctant saddle investing in innovation because of risks, costs and lack of information. Barriers growing and lack some local success models in collaboration university – industry stresses distance from the two sectors.

Capacity administration and professional is limited.

The centers and incubators ReNITT being works, in many cases, with insufficient staff prepared in field property intellectual property, licensing negotiations or the development of public- private partnerships.

The procedures slow bureaucratic processes affect and may much dynamics TT processes.

Disparities regional majority in patenting activity.

Distribution analysis patents at regional level reveal a concentration a innovations in two regions:

North-East ( Iași ) – leader national in 2023–2024; Bucharest–Ilfov and North-West – performances high thanks to universities big.

South-West Oltenia, South Muntenia regions and the Southeast presents an activity reduced patenting, reflecting the low

investment in research and absence some ecosystems innovation developed.
South-West Oltenia Region confirm trends national.
Although region has three university publicly and three national research institutes, the TT activity is modest. The existence of only two business incubators and two technology transfer centers accredited ReNITT indicates an ecosystem reduced. Small number of patents obtained in 2023–2024 confirms need strengthening innovation infrastructure.

Lack dates regarding patents from research institutes, companies and people body represents a limitation major. Without a complete picture on production national property intellectual, cannot be assessed precisely capacity Romania 's real innovation and any degree of alignment with policies Europeans regarding innovation and transfer technological.

Romania is located in a stage of development intermediate system national innovation. There is players relevant, infrastructure in expansion and successful examples, but the barriers institutional, cultural and administrative obstacles recovery the real potential of research. To align recommendations Union Europeans and to grow competitiveness economic, it is needed consolidation relationships between academia and environment private, professionalization technology transfer centers, stimulating investments in R&D and creation of a crops national collaboration for innovation.

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