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BOOST
Smart Innovation Ecosystems

ROMANIA - national & regional innovation framework & North-West ROMANIA Regional analysis of the innovation status

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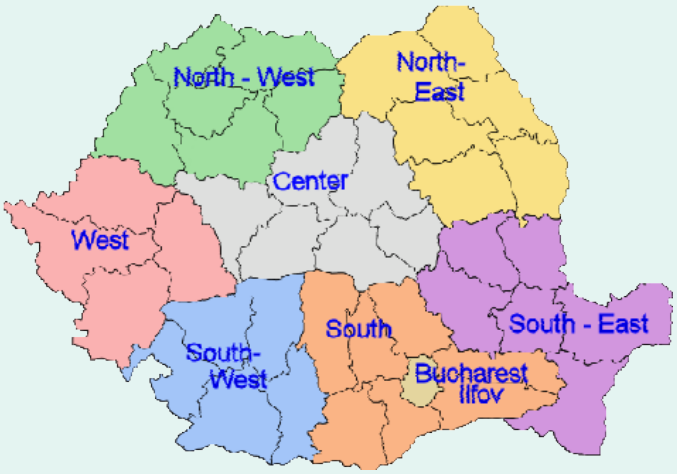
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ROMANIA - national & regional innovation framework

Romania has 8 development regions at NUTS2 level, which have no legal and administrative status, but play an important role in the implementation of the Cohesion Policy programmes and regional statistics. They were established in 1998 by the regional development law, currently updated by **Law no.315/ 2004.**



According to RIS 2021, all Romania regions are Emerging Innovators. Regional performance differences are high in Romania with the best performing region, București – Ilfov (RO32), performing more than 3.4 times as well as the lowest performing region, Sud-Vest Oltenia (RO41). Performance relative to the EU in 2014 has improved for six regions and declined for two regions.

In each development region is functioning one regional development agency (RDA), which is a non-governmental and non-profit body of public utility, with legal personality, operating in the field of regional development.

The RDAs are responsible for coordinating the design and implementation of regional development strategies and plans, being the executive bodies of the corresponding Regional Development Councils, composed by appointed elected mayors and county council presidents. In the previous programming period, the RDAs acted as Intermediate Bodies for the ROP 2014-2020 and currently are Managing Authorities for the eight regional-level Regional Programmes (RP) in 2021-2027.

- Research, development & innovation GOVERNANCE

In Romania, the institutional framework for Research, Development and Innovation (RDI) System has been changing in the past decades. The governance system has been modified following governmental changes, involving the creation of new entities or the shift of responsibilities between existing ones. The current situation is displayed in the figure below.

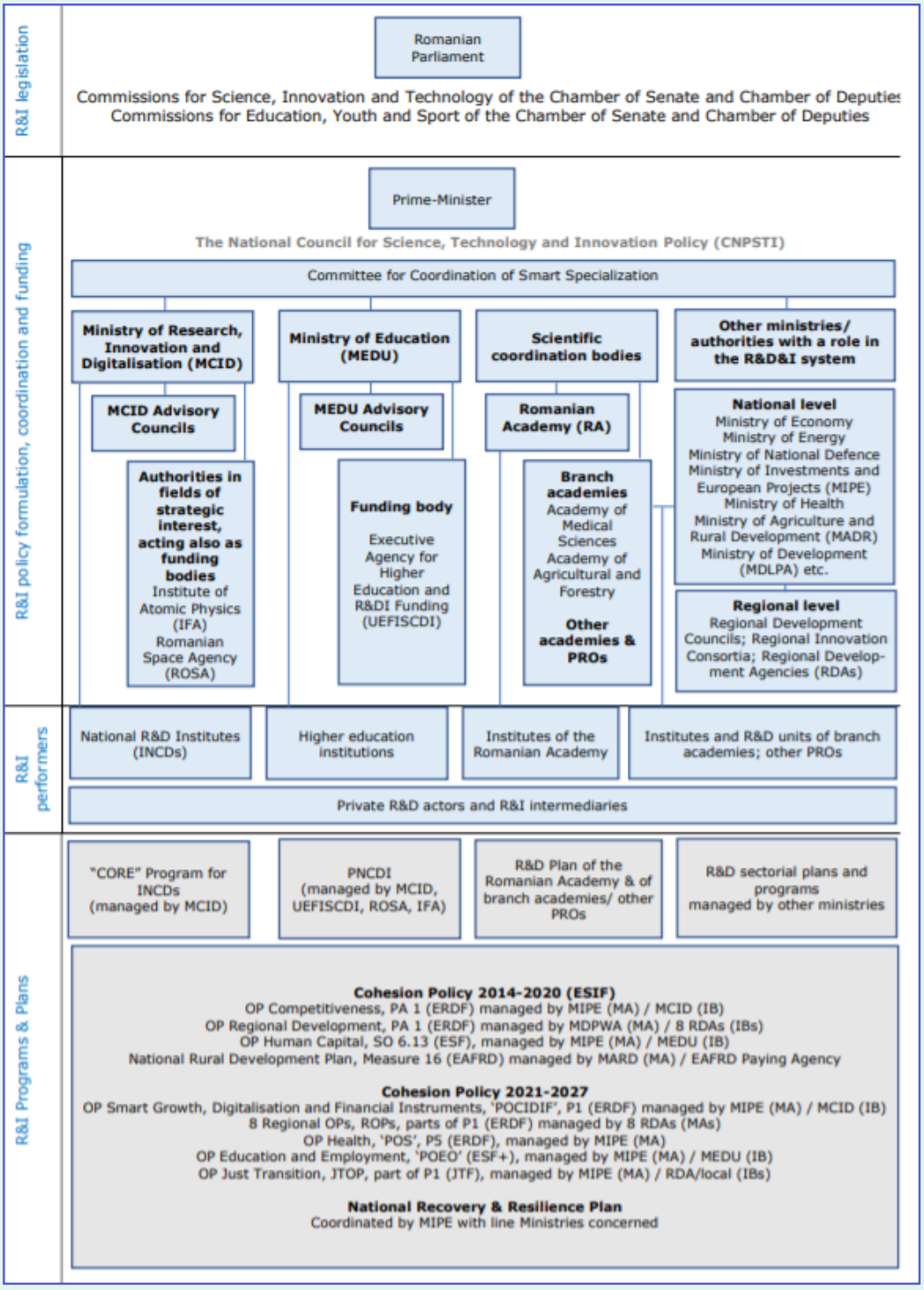


Figure no. 1. Romanian R&G governance system

RDI legislation - **The Commission(s) for Science, Innovation and Technology of the Chamber of Senate** and the C**hamber of Deputies of the Romanian Parliament** have the mission to develop the legal framework and prepare the budget law. In December 2020, the former Commission(s) for Education, Science, Youth and Sport of the Romanian Parliament were split, to better reflect the new organisation of the Romanian Government, with two different ministries being in charge of science, innovation and technology on the one hand (currently Ministry of Research, Innovation and Digitalisation) and Ministry of Education, on the other.

RDI policy formulation, coordination and funding - **The National Council for Science, Technology and Innovation Policy (CNPSTI)** is a consultative body, under the Prime Minister's authority, on R&I matters. Its task is to advise the government in this field and follow-up and monitor strategy and policies.

The State Authority for RDI in Romania is the **Ministry of Research, Innovation and Digitization (MCID).** The MCID develops, updates and ensures the institutional framework for the implementation of the National Strategy for Research, Innovation and Smart Specialisation (SNCDI until 2021, SNCISI from 2022). It coordinates government policy at the national level, monitors the level of R&D activity, and conducts, in some cases, programmes or parts thereof. It establishes the strategic objectives included in the N**ational Plan for Research, Development and Innovation (PNCDI)**, as well as some other specific instruments for the implementation of SNCDI/SNCISI in accordance with the priorities of the Government. MCID is advised by 6 consultative bodies: National Council for Scientific Research (CNCS), Romanian Committee for Research Infrastructures (CRIC), Advisory Board for R&D&I (CCCDI), National Council for Ethics in Scientific Research, Technological Development and Innovation (CNECSDTI), National Council for Technology Transfer and Innovation (CNTTI) and Committee for Coordination of Smart Specialisation (CCSI).

MCID is coordinating 43 National R&D Institutes (INCD) and 2 specialised executive agencies: Romanian Space Agency (ROSA), and Institute of Atomic Physics (IFA) . .

The Romanian Academy (RA) functions autonomously. The RA has its own chapter in the state budget, and its research institutes conduct their activities on the basis of their own research plans, under the direction of the scientific sections of the Academy.

The Ministry of Education (ME) is the central public authority responsible for public education, training and scientific research at the universities. ME manages the National Strategy for Tertiary Education 2015-2020, monitors the application of the Law of National Education, and allocates state funds for public universities, amongst other responsibilities. MEDU is supported by councils, agencies and consultative bodies.

The Executive Agency for Higher Education and R&I funding (UEFISCDI), under ME, is the executive agency for part of the programmes of the National Research, Development and Innovation plan (PNCDI). UEFISCDI manages some, but not all of PNCDI components based on a contract concluded with the National Authority for R&D/MCID. Along with the responsibilities for funding higher education and research, UEFISCDI is responsible for the coordination of various programmes and sub-programmes of PNCDI, such as "Human Resources", "Increasing the competitiveness of the Romanian economy through Research, Development and Innovation", "European and international cooperation", and "Fundamental and frontier research".

Other Ministries play a role in the RDI system are: the Ministry of Economy and Ministry of Entrepreneurship and Tourism; the Ministry of Agriculture and Rural Development (MADR); the Ministry of Health; the Ministry of Investments and European Projects (MIPE); the Ministry of National Defence; the Ministry of Energy and the Ministry of Finance.

National Contact Points for European R&D&I programmes are national structures established and financed by governments in all EU member states and the states associated with the framework programme, helping the potential beneficiaries in accessing these programmes.

- **Horizon framework programmes** - there are currently 36 NCPs in Romania, coordinated by MCID. The NCPs are hosted mostly by MCID departments and governmental agencies but also by public universities or national research institutes.

At regional level, the **Regional Development Agencies**, NGOs of public utility as executive bodies of the Regional Development Councils, have the role to act towards regional development and innovation support, including as their roles in the implementation of the Cohesion Policy, in charge of the Regional (Operational) Programmes.
Starting with 2020, the **National Authority for Digitalisation (ADR)** has been set up under the direct subordination of the Prime Minister/ of the Government, with the role to elaborate and coordinate the implementation of the strategies and public policies related to digitalisation/ ITC.

• Research, development & innovation SYSTEM

The national research and development system is functioning according to Law 324/ 8th July 2003 and is made up of all the public and private law units and institutions with legal personality, whose object of activity is research and development and includes the following categories:

- National research and development institutes;
- Research institutes, centres or stations of the Romanian Academy and research and development institutes of branch academies;
- Accredited higher education institutes or their structures;
- Research and development institutes or centres organised within national companies, national companies and autonomous regions of national interest

Public law units and institutions can be:

- Research and development institutes, centres or stations organised as public institutions;
- Research and development institutes or centres organised within national companies, national companies and autonomous regions or central and local public administration;
- International research and development centres established on the basis of international agreements;
- Other public institutions or their structures whose object of activity is research and development.

Private law units and institutions:

- Research and development units organised as companies;
- Commercial companies and their structures whose object is research and development;
- Accredited private higher education institutions or their structures;
- Non-governmental organisations whose activities include research and development.[1]

Romania's research, development and innovation (RDI) system comprises 263 public RDI organisations and about 600 enterprises. Of the public organisations, 56 are authorised public universities, 46 are national R&D institutes (43 of which are coordinated by the Ministry of Education), and 65 are research institutions and centers of the Romanian Academy.

Innovation and technological transfer entities[2] are periodically authorized by the national level according to HG 406/2003, to capitalize the results of the technological research and development towards the business sector. They can be public or private, organized within existing organizations or separately and can be the following:

- innovative business incubator centers
- technological transfer center
- technological information center
- industry liaison offices
- scientific and technological parks.

Currently, there are 44 ITT entities in Romania (40 accredited and 4 provisionally accredited), which, together with 4 S&T Parks, constitute the National Network for Technology Transfer and Innovation (RENITT). The network provides different types of specialized services to public and private customers, including:

- assistance for innovation and technology transfer activities, development of experimental models and prototypes, exploitation of intellectual property rights;
- technology information, technology audit, technology forecasting;
- legal advice on legislation at national, European and international level;
- physical or virtual incubation for innovative SMEs.

1. [https://www.cdep.ro/pls/legis/legis_pck.htp_act_text?idt=49343]
2. *HG 406/2003 for the approval of Methodological Norms specific regarding the constitution, operation, evaluation and accreditation of innovation infrastructure entities and technological transfer and Ministerial Order no. 3686/11.04.2008 of the Ministry of Education, of Research and Youth (MECT) for approval Procedures regarding the accreditation of infrastructure entities of innovation and technological transfer*

• POLICY & STRATEGIES boosting research, development & innovation

AT THE NATIONAL LEVEL, in Romania, the national government body responsible for research and innovation policy making and implementation is the Ministry of Research, Innovation and Digitization (MCID).
Main policy instrument for the RDI in Romania is the **National Plan for Research, Development and Innovation (PNCDI)**. There was a large gap between the planned budget for PNCDI for the period 2014-2020, set at €7b, and the actual budget spent, which by the end of 2020 reached only 11% of the planned amounts, with total allocations of €785m (according to data communicated by MCID). In 2020, to form the bridge until the adoption of the subsequent Strategy and Plan, PNCDI III was extended until adoption of PNCDI IV. The new PNCDI covers the period 2022-2027.

In the programming period 2014-2020, **Smart Specialisation Strategies (S3)** in Romania have been implemented both at national and at regional level, each level being guided by specific methodologies for the identification and operationalisation of priorities and performing distinct activities:

A. At national level, MCID is acting as coordinator of research-innovation and smart specialisation policy in Romania, the national funding programmes associated with RDI and the regulatory framework. S3 at national level is implemented mainly through PNCDI but also through other FEDR operational programmes which finance research and innovation. Projects related to the national S3 priorities are eligible for funding from the main funding instruments linked to national and EU programmes coordinated by other ministries.

- **2014-2020**: national S3 was equal to the **National Research and Innovation Strategy (NRIS)[3] 2014-2020** and was addressed to 4 priorities: (i) Bioeconomy; (ii) ICT, Space and security; (iii) Energy, environment and climate change (iv) eco-nano-technologies and advanced materials.
- **2021-2027: The National Strategy for Research, Innovation and Smart Specialisation (SNCISI)[4]** , elaborated under MCID coordination, was approved during 2022. The strategy identified updated S3 priorities: (i) Bioeconomy; (ii) Digital economy and space technologies; (iii) Energy and mobility; (iv) Advanced manufacturing; (v) Functional advanced materials; (vi) environment and eco-technologies; (vii) Health.

B. At regional level, S3 priorities have been defined in the regional S3 strategies elaborated by the 8 development agencies and approved by the Regional Development Councils, They were enforced for 2014-2020 period and currently updated for 2021-2027. Each region has set up a Regional Innovation Consortium, with a consultative role for S3 processes. The S3 strategies define areas of local strength and priority for each region, in correlation with the Regional Development Plans.
Under the 8 RPs in preparation for 2021-2027, the new regional S3s will form part of the enabling condition to access Cohesion Policy Funds under Policy Objective 1[5]

Strategy for the Digital Agenda of Romania 2015-2020 - to be updated for the current period.

3. https://uefiscdi.gov.ro/strategia-cdi-2014-2020
4. https://www.research.gov.ro/uploads/comunicate/2022/strategia-na-ional-de-cercetare-inovare-i-specializare-inteligent-2022-2027.pdf
5. https://ec.europa.eu/research-and-innovation/sites/default/files/rio/report/PSF-RO-Final-Report_03.06.2022.pdf

Romania's Startup Ecosystem Strategy with national coverage has been elaborated by RoStartup in 2022, under the coordination of North-East RDA. The analysis of the current portfolio of public instruments reveals weaknesses on program design, while a variety of new modalities of public support for entrepreneurship could be considered. The strategy is not embedded into the national innovation support framework, but is a valuable initiative and document to be considered and inspired from, in further designing of the BOOST Action Plan.

AT THE REGIONAL LEVEL, in Romania, there is no regional innovation policy authority. The support of innovation at regional level is justified by the strategic and programmatic documents developed at the local and regional level. In the North-West Region, the most important are the following, addressing regional and local development, urban (& rural) regeneration, competitiveness and innovation, coordinated by regional or local authorities, as follows:

	STRATEGY	Level Regional/ Local	Responsible authority
A	**Regional Development Plan & Strategy**	regional	North-West Regional Development Agency
B	**Regional Smart Specialisation Strategy**	regional	North-West Regional Development Agency
C	**Sustainable Urban Mobility and Smart Cities Strategy**	regional	North-West Regional Development Agency
D	**County Strategies**	local	County Councils
E	**Integrated Urban Development Strategies**	local	Local councils/ municipalities
F	**Smart City Strategies / or Digital Transformation Strategies**	local	Local councils/ municipalities

A. North-West Regional Development Strategy

The regional context is represented by the elaboration of the Regional Development Plan and Strategy, for a period of 6-7 years, process coordinated by regional development agencies. **The Regional Development Plan (RDP)** enclosing the Regional Development Strategy - is the main planning document at regional level and reflects the relevant development policies at national level in relation to the specific needs at regional level, but also with the strategic policy directions of the other main donors to the regional development programmes related to the respective region. The document is considered the strategic basis for projects initiated at regional level and can be taken into account by national authorities for the basis of funding programmes for the next programming period. The objectives of the Regional Development Strategy promoted through the RDP follow the needs identified at the regional level through various instruments: public consultations, working groups, taking over project ideas proposed at the local and county level, etc. Equally, the identified development priorities were aligned with the main strategic objectives of the EU cohesion policy, in particular the types of interventions financed by the European Regional Development Fund (ERDF). Among the priorities of the North-West Regional Development Strategy 2021-2027, *Priority 1 aims to increase the competitiveness of the region by supporting the innovation ecosystem and economic activities in the fields of smart specialization, supporting the digitalization process of the economy, promoting entrepreneurship and stimulating research and innovation.*

B. Smart Specialisation Strategy for the North-West Region of Romania

At the level of the North-West Region, the first Regional Innovation Strategy was developed for the period 2005-2008, with the general objective of increasing the attractiveness and competitiveness of the North-West Region by creating a support system for innovation and by promoting a culture of innovation.

For the period 2013-2020, the North-West Regional Development Agency elaborated the Smart Specialization Strategy of the region within a participatory process, with the support from the EC Joint Research Center, funded by a preparatory action of the European Parliament and part of the pilot project of DG Regio and Urban Policy for less developed regions "Lagging regions".

The S3 strategy was updated during 2020, taking into account the new legislative package on the implementation of European funds related to the 2021-2027 financial framework.

The project's portfolio of the S3 is the result of an extensive consultation process of key actors at the regional level, especially through Entrepreneurial Discovery Process (EDP) workshops, but also through other methods, especially open announcements, launched In this regard.

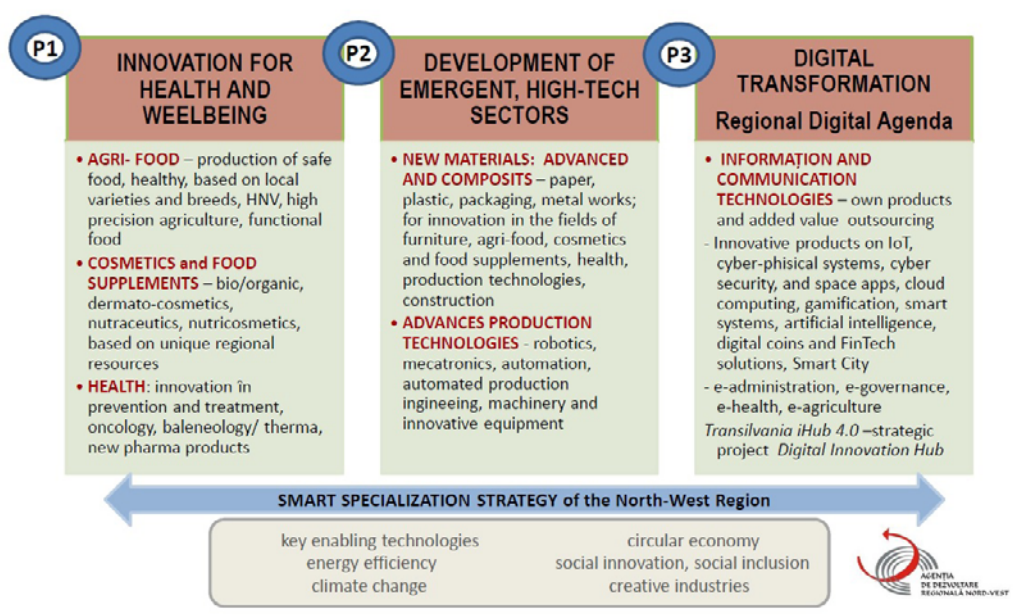


Figure no. 2. – Pillars of Smart Specialisation Strategy 2021-2027
Source – Smart Specialisation Strategy of the North-West Region 2021-2027

The smart specialization sectors in the North-West Region of Romania are grouped on 3 main pillars:

Pillar I - INNOVATION FOR HEALTH AND WELFARE

Objective: To support innovation in areas with a tradition in the region to improve the health and well-being of a large number of inhabitants.

The priority areas targeted – *agri-food, cosmetics and food supplements, health* - are characterized by the existence of a critical mass of businesses and employees and/or intense research and development activity. All three areas have a direct impact on the quality of life of the population and can exploit the same types of unique natural resources. In particular related to BOOST target sectors, the ones related to HEALTH are mainly:

- Bio-cosmetics and natural food supplements, without chemical additives, especially:
- Dermatocosmetics; nutricosmetics, nutraceuticals, fitochemical/ fitoproducts, natural plant extracts, algae, sericigenous insects etc. for cosmetics and food supplements;

•Oncology, especially personalized treatments with nutraceuticals, fitochemical/ fitoproducts, innovation in prevention and treatment;
• Balneology,
• Implantology,
• Transplants,
• Nutrition, curing diabetes,
• Psychology, psychiatry
• Blood substitute based on hemoglobin (disruptive innovation);
• Innovative pharmaceutical and health products or services.

Pillar II - DEVELOPMENT OF EMERGING SECTORS

Objective: To exploit the results of R&D based on advanced technologies for the development of emerging specific economic activities in line with global trends.

The pillar is about identifying technologies and new materials that do not adversely affect (do little or no harm to) the health of the population, that support the concept of sustainability, reducing pollution, making systems, resources and raw materials more efficient and improving climate change.

• Composite materials obtained from recycling waste from the furniture industry
• Solutions for a circular economy
• New packaging materials for conserving food
• Intelligent biocompatible materials
• Advanced, composite, and other new materials, functional covering of materials, nanomaterials (paper, plastic, ceramics, types of metal, etc.)
• Composite materials based on vegetable fibers
• Robotics, mechatronics, automation, advanced production engineering, additive manufacturing (i.e. rapid prototyping)
• Innovative machinery and equipment for electricity production, especially from renewable sources, which are more energy efficient and are more environmentally friendly
• Solutions for a circular economy
• Increasing energy efficiency in production

Pillar III - DIGITAL TRANSFORMATION: Regional Digital Agenda

Objective: Digitize the economy and society, supported by the ICT sector's transition to innovation

Digital technology, in the context of Industrial Revolution 4.0, is one of the most important drivers of global development and progress. The main sub-sectos are:

• Internet of Things; Cloud computing, Gamification;
• Cyber physics systems, spatial applications for civil use;
• Intelligent systems, artificial intelligence;
• Crypto currencies and FinTech, smart city solutions (with emphasis on energy efficiency);
• E-administration

The potential of digital technologies and services to contribute to bridging the development gap, providing solutions to existing global challenges and increasing European industrial competitiveness should also be harnessed at regional level. Thus, the digitisation of the economy and society, supported by a developed and innovation-driven ICT sector, is necessary not only to maintain regional competitiveness in the long term, but also to support innovation.

C. Regional Strategy for Sustainable Urban Mobility and Smart Cities of the North-West Region 2021-2027

The proposed vision envisages the North-West Development Region in 2030 as a smart territory supported by a network of interconnected and innovative cities that use technology to facilitate sustainable development. Thus, innovation, the relationship between the administration and the citizens and the care for the efficient use of resources are the key to the progress of the region. The North-West smart region will rely on a digital network of localities consisting of regional, county, micro-regional and local innovation centers and cities that are developing on smart city levels depending on their potential: tourism, energy - environment, quality of housing, education, etc. At the local level, municipalities and cities will have data collection infrastructure, sensor networks and other devices that form IoT (internet of things) networks, generate complex data sets available to the general public and used.

D. Country Strategies

The County Development Strategies identify the real development needs of the counties, on a consultative basis (working groups, survey among the population and the business environment, consultations, public debates), which ensures consensus on priorities of development of the county, in defining the directions of strategic action, in the short, medium and long term, and in their transposition into a portfolio of projects, which will ensure the premises for the implementation of the strategy.

The County Councils are considering the preparation of a comprehensive document that will substantiate the decision-making process regarding the medium and long-term strategic development of the county. Usually the process is assisted by strategic consultants.

This document takes into account and integrates the following aspects: current and perspective trends in the development of the county; the major problems and development potential that, through its mobilization, could contribute to solving them; sectorial and comprehensive strategies relevant for the development of the county; large-scale plans and projects that influence the development of the county; guidelines regarding regional and national development; the guidelines of strategic documents and sectoral policies at the level of the European Union ("EU"); major aspects that mark the development of the EU and the Euroregion; other documents that will be identified during the process as being relevant for the county's strategy.

E. Integrated Urban Development Strategies

The integrated urban development strategy represents the framework that guides the process of identifying the strategic directions of intervention and choosing the order of the objectives for which they will be allocated resources, with the aim of determining the progress of the urban community. This process contains planning operational, which provides a structure of: programs, projects, actions, measures, which will be taken in a set time frame, of the necessary resources, of the expected results, as well as the responsibilities that must be assumed.

Each Integrated Urban Development Strategy presents the strategic objectives of the municipality, the key objectives, the strategic projects and the strategic profile of the municipality are presented.

- The Integrated Urban Development Strategy (IUDS) for the Municipality of Cluj-Napoca and its Metropolitan Area (CMA) is the main strategic planning document in the above-mentioned territories for the 2021-2030 period. Basically, it reunites under the umbrella of a common vision for development, as agreed and assumed by all the relevant actors from the local ecosystem

(administration, academic environment, business environment, non-governmental environment, and the civil society, etc.), the next year's intervention priorities in all the areas, from mobility, urban regeneration, digitalization, education, health or inclusion to local and metropolitan governance.

- The Integrated Urban Development Strategy (IUDS) for the Municipality of Oradea to summarize the priority directions of intervention for the 2021 – 2027 horizon, aiming at the optimal and responsible use of available resources to ensure an integrated urban planning. The strategy targets both the Municipality of Oradea and the communes that have voluntarily associated within the Metropolitan Area of Oradea, territorial entity with legal personality, established around the residence of county, as a polarizing urban center and integrating 11 other contiguous territorial administrative units, which they are also part of the functional urban area of Oradea Municipality.
- The Integrated Urban Development Strategy (IUDS) for the Municipality of Baia Mare and its Metropolitan Area (CMA). The document, developed by specialists, includes the most important projects that the Local Public Administration of the Municipality of Baia Mare wants to implement in the period 2015-2030. Among the most important development plans are the creation of a large industrial park, a creative industries center. To these are added other important projects that concern the social component, but also the rehabilitation and development of the urban infrastructure. Compared to the old integrated strategy, which focuses more on the social area, the current development strategy emphasizes the development of the economic segment.
- The Integrated Urban Development Strategy of the Municipality of Satu Mare 2016 - 2025 was developed in accordance with the provisions of the Sustainable Development Implementation Framework Document published by the Ministry of Regional Development, Public Administration and European Funds, as well as with Regulation (EU) no. 1301/2013. The strategic planning process generated a document capable of supporting the efficiency of city administration, which respects the principles of sustainable development and ensures coherence and agreement with regional, national and European policies.
- The Integrated Urban Development Strategy of the Municipality of Zalău 2024-2030 started from the diagnosis of the urban context, of the main problems and challenges at the local level identified in the preliminary analysis phase, built with the support of the Zalău City Hall and 4 working groups (local economic development; urban development and resilience; digitization and innovation and community development and smart governance). The permanent participation of local stakeholders in the stages of realizing the strategy represents a fundamental element for ensuring a transparent process, based on participation, representativeness and adaptation to the real local needs of the community.
- The Integrated Urban Development Strategy of the Municipality of Bistrita for the period 2021-2030 is currently developed.

F. Other innovation related strategies

Cluj-Napoca has a Digital Transformation Strategy since 2021. The key strategic factors are:

- Smart living - integrating digital technologies in the community's life
- Digital skills and digital inclusion
- Interconnected digitalisation

The operationalisation of Cluj-Napoca Digital Transformation Strategy[6] will be undertaken by multiple departments within public institutions, and public managers, in cooperation with other stakeholders. Access to data will help take the right decisions and generate coherent public policy projects. The digital transformation will use all available resources and will involve, through permanent partnerships, citizens, the public sector, academia, private companies, clusters, non-profit organizations and innovation centres. It is also planning to establish 'digital ambassadors' within the city hall departments to propose and support digital transformation projects.
The prioritization of action directions and projects will be done by the new department created for this purpose in the City Hall, the principle being that of Innovation Office, used by most cities that stand out through digitalisation and innovation. The strategic actions directions:

- Improving public services
- Digital inclusion and competencies
- Citizen data protection and cybersecurity
- Universities, innovation and cooperation
- Interconnectivity and and data-driven decision-making
- Developing the municipal digital infrastructure
- Participation and transparency
- interconnected mobility

Oradea Smart City Strategy 2016-2025, addressing digitalisation of the public administration, as well as green and tourism components.

6. *Digital Transformation Strategy of Cluj-Napoca, 2021, Faculty of Political Sciences and Administration, Babes Bolyai University*

• PROGRAMMES boosting research, development & innovation

Romania has entered its 3rd 7-year EU Cohesion Policy phase since its accession to the European Union in 2007. Each phase has provided large-scale EU funding support to the country, including for investment in R&I.
During the 2014-2020 phase, FESI have supported nearly half of Romania's public investment overall, and represented 25% of total national public financing for research in the country. Now Romania is entering the 2021-2027 phase of EU Cohesion Policy, for which it has the 3 rd highest financial allocation (equating to some €25.2bn), after Poland and Italy, to be co-financed and disbursed by the end of 2029. R&I has higher Cohesion Policy prominence at EU level for 2021-2027 than for the previous two phases.

Romania persistently directs remarkably low proportions of its EU Cohesion Policy allocations towards the promotion of R&I, compared to other EU13 countries. Indeed, Romania's Cohesion Policy allocations to R&I rank among the lowest in the EU. For 2021-2027, the overall indicative allocation Romania makes to R&I is €1.92bn (without JTF), approximately 6.1% of its total EU Cohesion Policy envelope. Whilst this is appreciably higher than the 2014-2020 allocation of €1.08bn, it is still very low.

2014-2020 Programmes supporting innovation

Out of the 7 operational programmes in Romania, 4 of them directly supported innovation. They are available for all the regions and are implemented at national level, some having Intermediate Bodies at regional level (such as ROP).

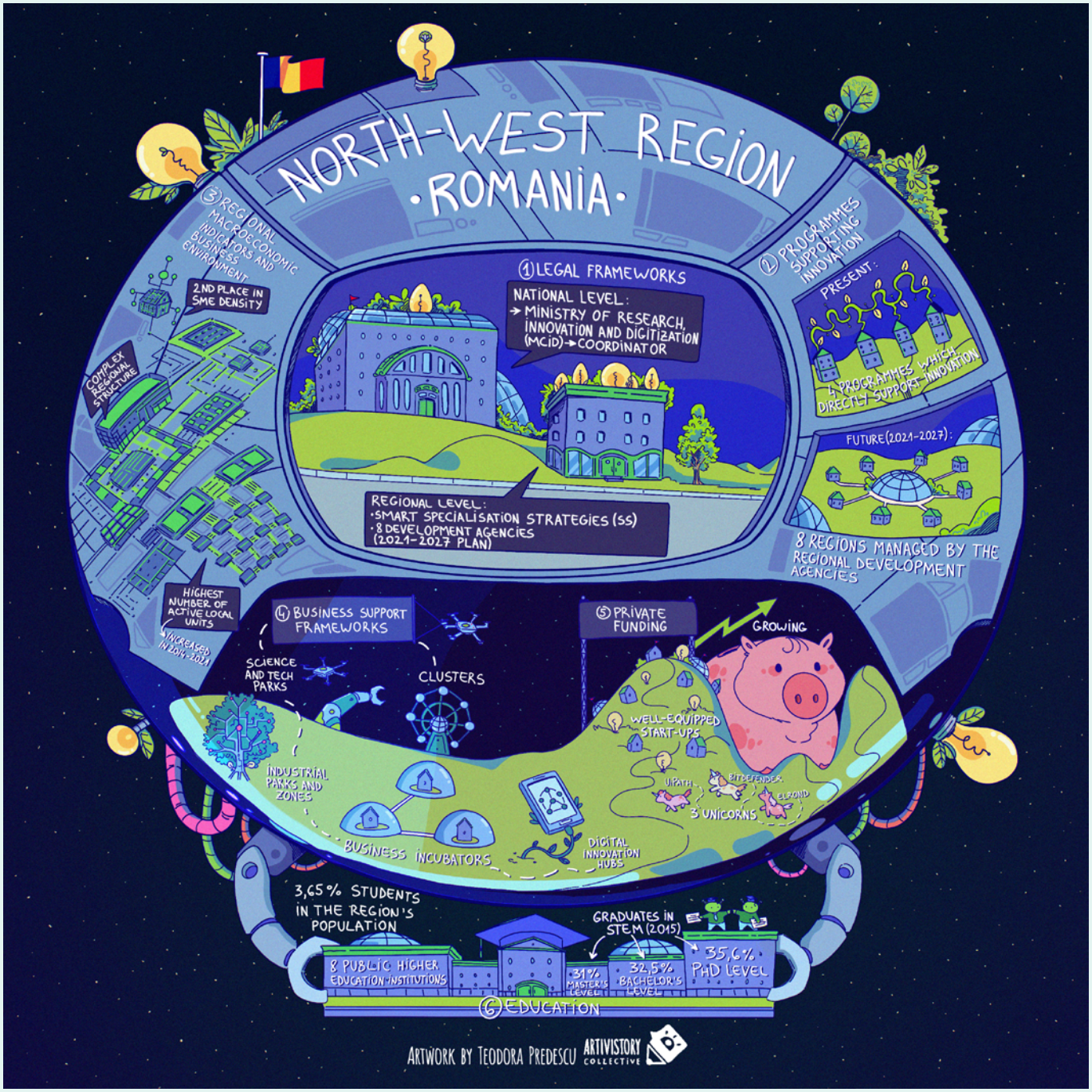
	Name of the program	Priority area Measure/ Call	Target beneficiaries	(N) National/ (R)Regional/ (E) European	(I) Individual application or (C) Collaborative
1	**OP Competitiveness (OPC) / ERDF**	PA1 - Research, development and innovation supporting economic competitiveness and the development of businesses	● Public institutions with legal personality, which are part of the national research and development system ● Partnerships between research and business	European / FEDR	Individual Collaborative
2	**OP Regional Development (ROP) / ERDF**	PA1 – Promotion of technology transfe	Innovation and technology transfer entities authorized/ accredited	European / FEDR	Individual
3	**OP Human Capital (OPHC -'POCU') / ESF**	PA6 – Education and Competencies (Only SO 6.13 - Increasing the number of university and non-university tertiary education graduates who find a job, including a research job)	SME, Central public authority, Chamber of Commerce, educational institutions, public-private partnership, Agricultural cooperative, Group of producers, Cooperative society, Composers, commons and others Professional associations Provider of guidance, Counseling, School mediation and alternative services	European / FEDRl	Individual
4	**National Rural Development Plan (NRDP) / EAFRD***	P1 - Knowledge transfer and innovation in agriculture, forestry and rural areas (Measure 16 - Cooperation, clusters and networks, EIP operational groups for agricultural productivity)	Farmers and foresters, SME in the food processing sector; researchers, research institutes and lab, universities, advisors; NGOs in the agriculture, forestry, environment and water conservation sectors; or municipalities and public entities.	European / FEADR	Collaborative

2021-2027 Forthcoming Programmes supporting innovation in North-West Romania

For the first time, the Regional Programmes are different for each of the 8 regions and are managed by the regional development agencies. In addition to the Cohesion policy programmes, the EU members states benefit from the National Recovery and Resilience Plans, following COVID-19 pandemic.

	Name of the program	Target beneficiaries	(N) National/ (R)Regional/ (E) European	(I) Individual application or (C) Collaborative
1	**North-West Regional Programme**	SME; Universities; NGOs, City Halls	European/ FEDR	(I) Individual application
2	**The National Recovery and Resilience Plan (NRRP)**	Authorities/institutions and central public services with attributions in field; Authorities/institutions and local public services with attributions in the field; Public or private providers of employment services/services of vocational education or training/ assessment and certification services skills/career information and counseling services; Educational units from the national education system; Higher education institutions; Research institutes; Youth associations; Chambers of commerce; Non- governmental organizations	European/ Next Generation Initiative	(I) Individual application
3	**POCIDIF**	Central Authority; Local authority; Regional authority; Authorities & Private Entities; Research centers and institutions; SMEs; Educational institutions	Europeanl/ FEDR	(C)Collaborative
4	**PNCDI IV**	Entities involved in research and innovation activity, both from the private and public environment, representatives of the business environment (SMEs, corporations, professional associations), public authorities and non-governmental organizations	National/ European FEDR	(I) Individual application (C)Collaborative
5	**Programs of the Romanian Academy**	Researchers	National	(I) Individual
6	**Operational Programme for Fair Transition**	Legal entities of public sector established as bodies under public law or as bodies governed by private law entrusted with a public service mandate, with which a grant agreement has been signed under the Facility	European	(C)Collaborative
7	**Education and Occupancy Operational Programme**	Central authorities	European/ FSI	(I) Individual
8	**The Sectoral Plans of the Ministries**	Entities involved in research and innovation activity; Universities; Central authorities	National	(C)Collaborative
9	**The programs of the People's Academy of Science of Romania**	Researchers	National	(I) Individual application
10	**Health Operational Program**	Authorities of the Central Public Administration; Local Public Administration Authorities; Territorial administrative units; Territorial administrative subdivisions of municipalities; Deliberative authorities at the level of administrative units Public Health Units, Public Medical Institutes; Directorates of Public Health National Institute of Public Health; The Authority for Digitization of Romania Ministry of Health National Health Insurance House	European/ FEDRl	C)Collaborative

North-West ROMANIA Regional analysis of the innovation status



• Introductory data about the region

North-West Region has a favorable geographic positioning at the Western border of Romania, its features being heavily influenced by the close interactions with Western and Central Europe. The region borders Hungary in the West and the Ukraine in the North.



Figure no. 3. – Map of North-West Region

The **North-West Region**, also known as **Northern Transylvania**, is composed of 6 counties (Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu-Mare, and Sălaj) comprising 15 cities, 28 towns, 403 communes and 1,800 villages. It has a surface area of 34,160 km² (14.3% of the country) and in 2022 had a population of 2,523,143 inhabitants. The region is one of the most ethnically-diverse in Romania. The regional ethnic structure consists of Romanians (75%), Hungarians (18.3%), Roma (4.6%), Ukrainians (1.3%) and Germans (0.3%).

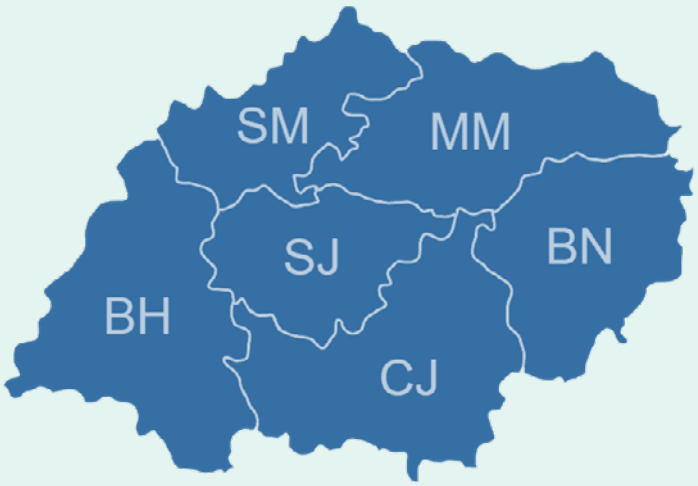


Figure no. 4. – Map of the Counties of the North-West Region

According to a recent study published by the World Bank taking into account two indices designed to assess the city performance (competitiveness index focused on current performance and attractiveness index focused on potential performance), Cluj-Napoca is the 2 nd city in Romania after Bucharest the capital and Oradea is listed 9 th in the national rank, especially due to the proximity of the Western border closer to European markets.

The rural environment of the North-West Region consists of 403 municipalities and it represents a percentage of 45% of the total population. Out of a total of 1800 villages, 48 villages belong administratively to municipalities and cities (making part of the urban environment, they are not eligible for rural development funds). Territory covered by rural settlements in the region is 29,285.93 km² representing 85.73% of total area. The municipalities in the region vary in size, with an average population of 3,060 inhabitants. The largest commune is Florești (Cluj County) with 41.503 inhabitants, (year 2020), due to close proximity to Cluj-Napoca. The second largest commune is Apahida (Cluj County) with 14.467 inhabitants, followed by Baciu (Cluj County) with 12.282 inhabitants[7]

- Macroeconomic indicators and business environment

The North-West Development Region is one of the least developed regions in the European Union, with GDP per capita (PPS) which was equal to 74% of the EU27 average in 2021, placing the North-West Region in the category of poorly developed regions (GDP/capita <75% of the EU27 average) In 2014, the value of the GDP per capita (PPS) for the North-West Region was equal to 56% of the EU27 average, between 2014-2021 this indicator increased by 18%.

According to the latest data provided by INSSE, in 2020 the value of GDP at the level of the North-West region was 132,190.5 million lei (26.438,1 Euros), representing a percentage of approximately 12.4% of GDP at the national level.

In 2020, Cluj county (42%) contributed the most to regional GDP formation, followed by Bihor (19%), Maramureș (14%) and Satu-Mare (10%) counties. Cluj County ranked second nationally in 2020, after Bucharest City with a value of PIB of 55.771,9 million lei (11.154,38 Euros).

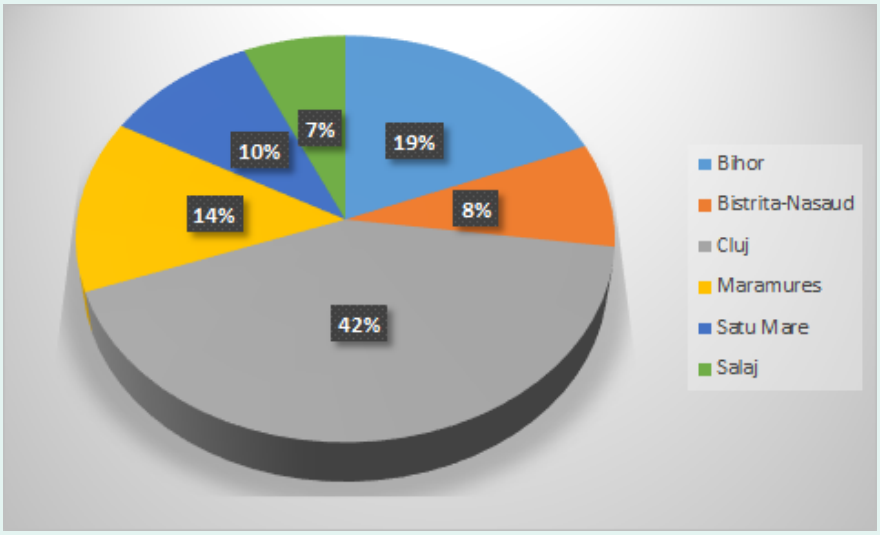


Figure no.5. GDP by counties of the North-West Region in 2020 Source: INSSE

7. NSSE, 1st of January 2020, https://insse.ro/.

According to the latest Regional Competitiveness Index for 2019, the North-West Region has ranked 246 th out of 268 European regions, but being in the same time the 3 rd most competitive region out of the 8 regions in Romania.

According to the latest available data, in 2020, the **region's economy** was based on services and industry, the predominant sector being represented by extractive industry, this sector represented approximately 23% of the regional GDP. According to INSSE available data, in 2020, the distribution of GDP per sectors of activity, in the North-West region is: extractive industry (23%); retail trade (20%); administrative activities (17%); real estate transactions (9%); ICT (8%); construction (7%); professional, scientific and technical activities; agriculture, forestry and fishing (5%); cultural and recreational activities; financial insurance (3%).

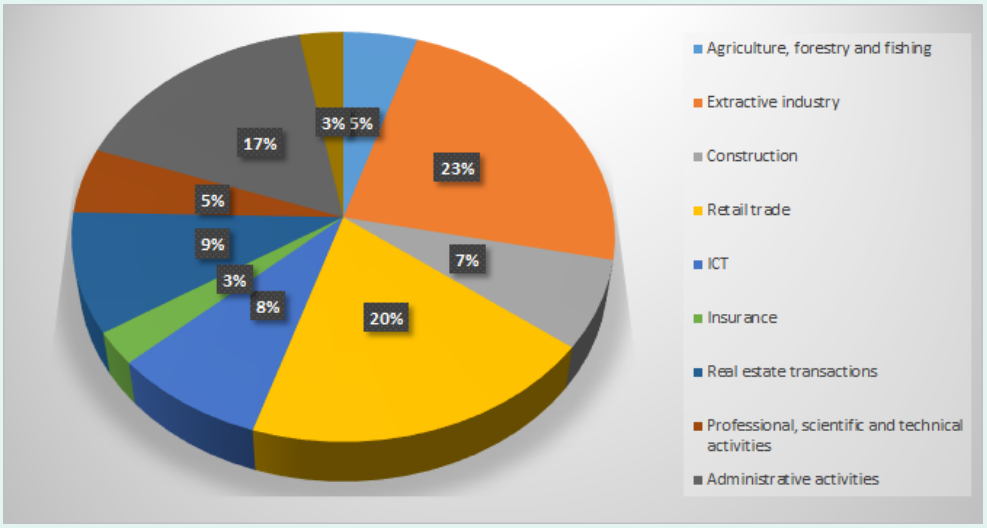


Figure no. 6. GDP by counties of the North-West Region in 2020
Source: INSSE

The structure of the regional economy is complex, with different weights at the county level. If Cluj has a strong tendency towards development, having a less developed primary sector, the economy of Satu Mare county is an industrial-agrarian one, with a more developed agricultural sector. Overall, the tertiary sector represents an important pillar of the regional economic structure, respecting the European economic structure.

No. of active companies / local units - The North-West Region has the highest number of active local units in the country after Bucharest-Ilfov, with 156.567 active local units in 2021, representing 14.95% of the national number. Cluj county ranks 2nd in the national hierarchy, after Bucharest. At the regional level, Cluj County has the highest share of active local units (38.695), followed by Bihor (21.762). The fewest local units were active in Bistrița-Năsăud (8.913), Satu Mare (8.976) and Sălaj (6.188) counties. Most of the enterprises are in the micro and small category (SMEs) and over 98,6% of the companies in the region have less than 50 employees. Only 11% of them are active in the industry, especially in the food industry, metal, wood processing and furniture manufacturing.

SME density - Related to the density of SMEs, in 2018, the North-West Region ranks second in the national hierarchy, with 33.44 SMEs/1000 inhabitants, above the national average of 29.43 SMEs /1000 inhabitants. According to the EU Annual Report on SMEs 2018/2019, the value of this indicator places Romania in last place at the EU-28 level, well below the average value of 58 SMEs/1000 inhabitants, the first place being occupied by the Czech Republic with 115 SMEs hours/1000 inhabitants.

Evolution of no of companies per sectors - In the period 2014-2021, the number of active local units at the level of the North-West Region increased by 34,91%. The sectors that had the greatest growth in 2021 compared to 2014 are: Health (+141%), Performing, cultural and recreational activities (+107%), Education (+146%), IT (+98%) and Real estate (+78%). At the same time, one sector registered a decrease in the analyzed period: Production and supply of electricity and thermal energy, gas, hot water and air conditioning (-29,88%).

The business structure in the North-West Region is dominated by real estate (24%), construction (14%), transport and storage (12%), professional, scientific and technical activities (11%) and manufacturing (10%). Manufacturing is concentrated on lowskill, low-tech sectors including food, textiles and wood, leather and rubber, plastic and metal products. For services, high-skill/ high-tech sectors are telecommunications and computer programming and related activities, while other dominant high-skill sub sectors include real estate, architectural and engineering activities and management consultancy.

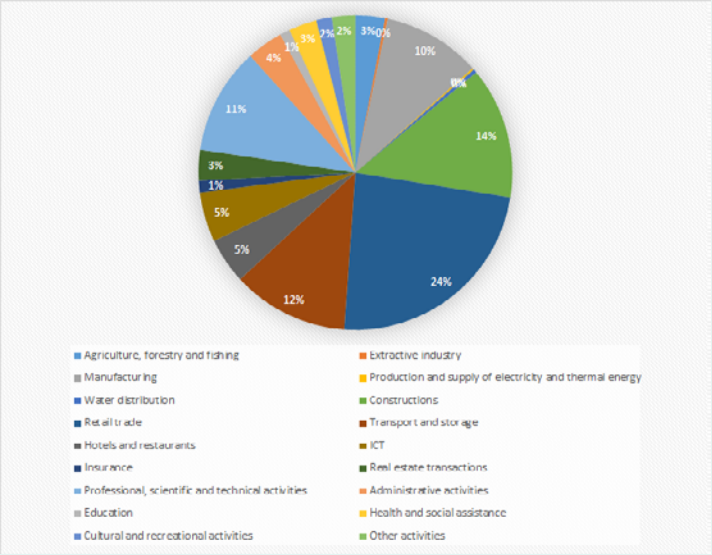


Figure no. 7. The structure of active local units, on activities of the national economy at the level of the North-West Region; Source: INSSE

The figure below presents the evolution of active units at the level of the North-West Region during the period 2014-2022 for the three sectors relevant for BOOS analysis: Manufactury, ICT and Health and social assistance. The manufacturing sector encountered an increase of 22.5% compared to 2014. The percent of active local units in the ICT sector raised with 49.6% compared to 2014 and the sector of health with 58.5%

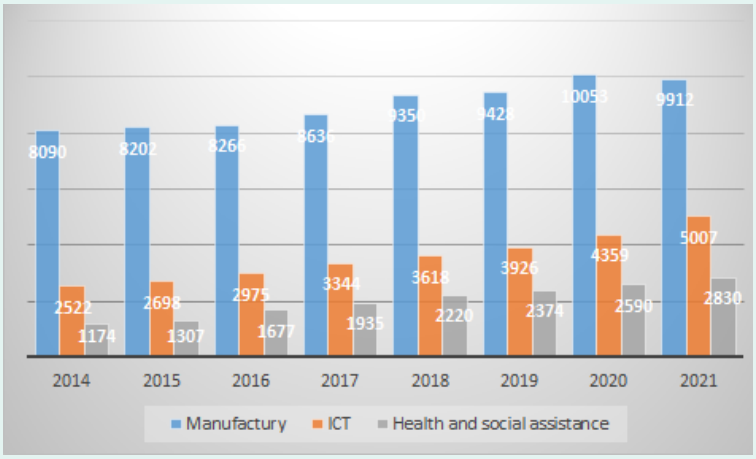


Figure no. 8. The evolution of active local units, on activities of the national economy at the level of the North-West Region Source: INSSE

Comparative advantages - Comparative advantages can be identified in industrial sectors with low technological intensity (leather and footwear, woodworking, furniture) and in several sectors with medium to high or even high technological intensity (ICT, machinery and equipment, electrical equipment). After the Bucharest-Ilfov Region, in 2018 the North-West Region has the highest concentration of ICT companies, the business infrastructure being relatively well developed.

Innovative companies

In the last year for which data are available on INSSE (2020), the percent of innovative companies in the North-West Region was 13.31% of the total number of innovative firms registered in Romania (2.900), with most of them located in the Bucharest-Ilfov Region. In 2020, from the total number of active companies in the North West region, only a percent 9.8% of the companies are considered innovative. The figure below shows that the number of innovative firms in the North-West region has grown from 2014 to 2018, from 401 innovative firms to 940 innovative firms, following that in 2020 the number of innovative companies has decreased dramatically to 386 companies

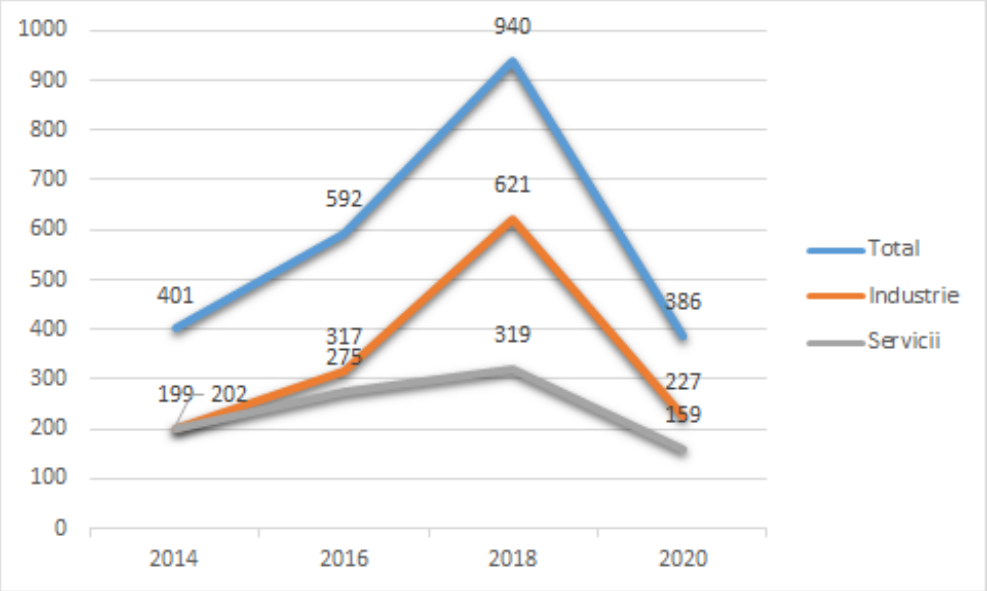


Figure no. 9. The evolution of number of innovative firms, by sectors of activity at the level of the North-West Region; Source: INSSE

• Business support framework

Industrial parks - The most visible business support structures are the industrial parks, which can be the result of public, private or even public-private initiatives. According to MDRAP data from 2022, from 106 such existing structures at national level that acquired the title of industrial park, a number of 25 are located in the North-West Development Region. The title of industrial park is the administrative document issued by the specialized body of the central public administration that gives to the industrial park the legal regime provided by Law no. 186/2013 on the establishment and function of an industrial park, with subsequent amendments and additions.

The industrial parks are located in the following localities: Bistrița, Carei, Câmpia Turzii, Cluj-Napoca, Dej, Feleacu, Jibou, Jucu, Oradea, Petrești, Săcuieni, Tileagd, Moldovenești and Turda. The biggest ones are in Cluj County - Tetarom 3 Industrial Park.

According to MDRAP, at the end of 2022 there were 25 industrial parks, which covered a total area of approximately 750 hectares. Of the 25 mentioned industrial parks, 6 are located in rural areas, the rest being located in urban areas. In the period 2007-2013, 5 parks benefited from non-refundable financial aid (four through the ROP and one through the Hungary-Romania Transfrontier Cooperation OP). Three of these projects (TETAROM 1 Cluj, ARC Parc Industrial Dej and Eurobusiness Parc Oradea) were projects to expand the existing infrastructure and two aimed at the creation of new industrial parks (Bistrița and Satu Mare).

Industrial zones - Along with the accredited industrial parks, a number of industrial zones or similar structures operate, such as the REIF Industrial Zone - Câmpia Turzii, the Nervia Park - Apahida, the Sud Satu-Mare Industrial Park, etc. which generally have the same characteristics and perform the same functions.

Science and Technology Parks (STP) are physical spaces that provide a space for collaboration between universities, research organizations and companies whose basic objective is to favor the generation of knowledge in distinct sectors, starting from the integration of scientific, technological and industrial interests but also the transfer of technology.

Although there have been some initiatives in this sense, at the moment there are no such functional structures in the North-West Region. Tetapolis, a STP established 10 years ago by the association of Cluj local administration and few universities, has remained at an incipient level to the date.

The construction of Bihor Scientific and Technological Park, an initiative of the Bihor County Council together with Bihor Industrial Park and the University of Oradea, is to be financed, the total value of the project amounting to approximately 7 million euros. This science and technology park is under construction and it benefited from non-refundable financial aid by Regional Operational Programme 2014-2020.

Business incubators - Business incubators are, according to the provisions of Law no. 102/2016, structures to support businesses that constantly aim to create a favorable and sustainable environment for newly established SMEs. In this way, businesses will have boosted their potential for growth and viability, helping them to develop in the early stages by providing shared facilities and the necessary managerial support. The founders of such structures can be legal entities under private law, as well as local public authorities, institutions/consortia of higher education institutions, institutes, research-development centers and stations, and chambers of commerce.

One of the oldest incubators in the North-West operates within the TETAROM 1 industrial park in Cluj. The business incubator is intended to support start-up companies. The main objective is to attract students interested in promoting valuable business ideas and young people who want to develop an innovative business. TETAROM SA concluded a collaboration protocol with the academic environment in Cluj-Napoca with the aim of: capitalize on the important human resources generated by Cluj universities and support through scientific research, innovation and technological transfer.

Also, in the 2014-2020 programming period through the Regional Operational Program, Investment Priority 2.1, Call for projects 2.1B - "Business Incubators" 8 new similar structures are currently funded for construction (with a total project value of over 28 million euros, of which 76 million non-refundable funding): 4 in Cluj county, , 3 in Bihor countryland one in Maramureș. Three of these projects are to be implemented by public authorities, the rest being private initiatives.

In October 2019, the Romanian Government approved a new law on supporting newly established companies through business incubators and accelerators, which aims to replace the Law no. 102/2016. The draft law clarifies some methodological and interaction aspects with the authority of the central public administration with attributions in the field of SMEs and simplifies the procedure for granting the title of business incubator by eliminating the feasibility study, as well as other regulations that made this procedure more difficult. Also, the project extends the validity period of the title of business incubator from 10 years to an indefinite period and, at the same time, the possibility of financing business incubators by using any legally identified source is extended. The law clearly mentions the tax facilities that the founder of the business incubator can benefit from, all of which are measures aimed at contributing to the long-term sustainability of these business support structures.

In recent years, in terms of business support structures, one can see the exponential increase in the number of new generation structures, such as ***co-working offices***, various ***business hubs, accelerators,*** etc. This trend indicates a growing interest in collaboration by young entrepreneurs, especially in high-tech sectors, thus contributing to the acceleration of spill-over effects and the exchange of information between innovative start-ups. Most of them are private initiatives, supporting the collaboration between new companies and start-ups and - even if they are not addressed to a specific sector - they have an important IT component. However, recently, structures with an emphasis on specific fields have also begun to appear. Without pretending to give an exhaustive list, among the initiatives of this kind we can mention: Cluj Hub (Cluj), Cluj Cowork (Cluj), Chaos Cowork (Cluj), Zain Studio (Cluj), Coworking Oradea (Bihor), Oradea Tech Hub (Bihor), Work Baia Mare (Maramureș) or Creative Minds Hub Zalău (Sălaj).

The list of coworking locations is completed by ***business accelerators***, whose mission is to improve the ecosystem of startups, helping them to develop quickly on the international branch. Since they are private, it is a challenge for them to last in time as a business, without public funding; the few examples were in Cluj-Napoca: Spherik Accelerator, Techcelerator, Risky Business, Hubcelerator.

Clusters - Romania does not have a dedicated cluster policy. The clusters which were established around 10 years ago followed Western associative models and some were also supported by two dedicated open calls in 2012 and 2013. The establishment of clusters at regional level was initiated and supported by the North-West RDA, including by attracting European funds, as part of the implementation of the Regional Innovation Strategy of the North-West Region 2007-2013. At the initiative of the North-West RDA, first clusters were generated in the fields of ICT, furniture and renewable energies starting from 2011. Currently there are 15 clusters operating in the region, most of them in- or around Cluj-Napoca, in fields such as: ITC, wood and furniture, agro-food, energy, thermal waters, space-technologies, life style, creative industries, tourism. Most of the clusters in the region have been created on the classic triple-helix model, the core being represented by the association of companies joined by research and education bodies, as well as public authorities that come to support these structures and bring additional visibility and lobbying. In recent years, in line with international trends, the scope of the types of actors has been broadened in most of these structures, gradually moving towards a quadruple helix format with

the increasing involvement of civil society.

Some of the clusters in the region are among the most mature in the country, with a relatively large number of members, with well-structured development and innovation strategies, recognized at European level by the European Secretariat for Cluster Analysis (ESCA).

Six of the clusters from the North-West Region formed in 2016 the Northern Transylvania Clusters Consortium, which in 2022 become a legal organisation under the name of SMART Transylvania, being active in organisation of dedicated events and responsible for facilitating collaboration within and out of the regional ecosystem.

Digital Innovation Hubs (DIHs) - After the launch in April 2016 of the first initiative of the European Commission regarding the Digitization of the Single Market (Digital Single Market), an important decision was taken to establish the Digital Innovation Hubs (DIH). Digital Innovation Centers are one of the key elements of the DEI strategy (Digitizing European Industry), formed by structures which offer assistance to companies, especially SMEs, towards digitalisation and new technologies.

There are two such Digital Innovation Hubs in the North-West Region), recognised also as European DIHs, following the European open call during 2021-2022. The DIHs will capitalize on the potential of IT&C companies and start-ups to offer digitization solutions for industry and public administration, and on the other hand, they will contribute to the digitization of areas of regional strategic importance. Public administration will have a particularly important role in Digital Innovation Hubs, as a partner in the Hubs' ecosystem and beneficiary of the digital tools developed and tested in the DIH infrastructure. Public administration will also benefit from digital skills training programs for employees and citizens to adopt the digital tools and innovations on a larger scale, which will contribute to the faster digitalization of the public administration. To achieve these objectives, the Digital Innovation Hubs will organize innovation experiments whose results will be technologies and innovations tested and validated by the public administration and beneficiary industries.

- Private funding

Private funding scenery in Romania. Evolution of private investments in Romania 2017-2022 and current status (2022)

Transaction volume in Romanian startups has continued to grow despite challenges in the global tech scene in 2022. The Romanian-born and Eastern European startups are considered well-equipped to handle future challenges. The Central and Eastern European region is one of the fastest-growing regions for VC funding in Europe, with a 7.6x growth since 2017.

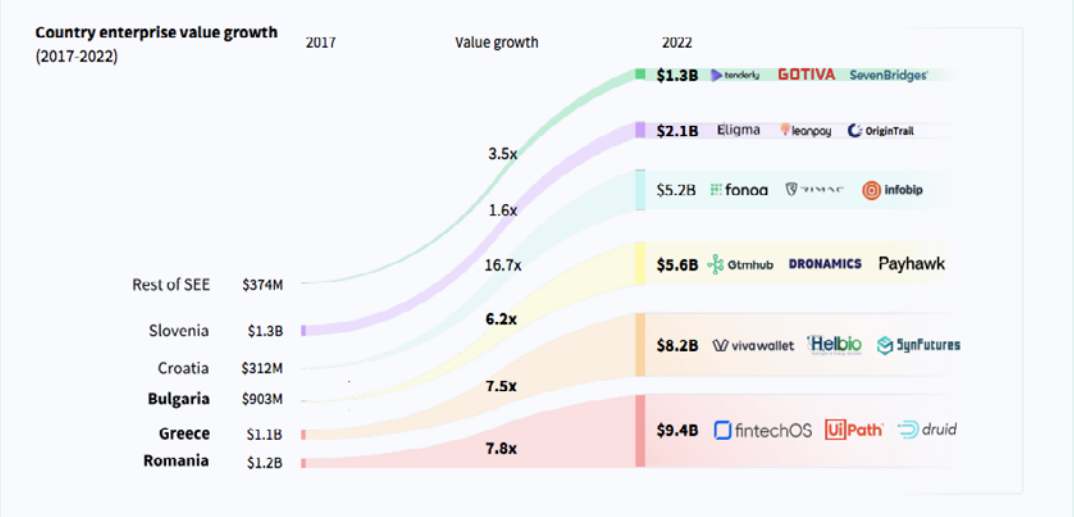


Figure no. 10. Romanian enterprise value growth
Source: Startups & Venture Capital in South Eastern Europe 2022, dealroom.co

The country is home to one of the most well-known IPOs in the region (UiPath), three successful unicorns (UiPath, Bitdefender, Elrond), and a wave of new startups awaiting to take off (Fintech OS, Soleadify, eMag, Tokinomo, Flowx AI.). Its particular strength lies in enterprise software, process automation, developer and collaboration tools, software development, cybersecurity, fintech, marketing & sales and creating value.

The success of tech companies is attributed to perseverance, founder's character, taking risks, promoting innovation, and unconventional approaches. The growth in the Romanian venture industry is seen as the successful continuation of an industry on the rise. The Romanian angel investors networks are well organized, with clear processes and very active in the pre-seed and seed rounds. Communication among Romanian angel networks is good and co-investments are the norm.

According to the International Monetary Fund, International Financial Statistics and Balance of Payments databases, World Bank, International Debt Statistics and OECD Romania's net flow of Foreign direct investment was 3,7% of GDP in 2021 - an increasing trend compared to 2020.

The Private equity investments was 0,035% of GDP in 2021, also an increased Annual investment value compared to 2020 (Invest Europe, Central and Eastern Europe Private Equity Statistics 2021).

For 2022, the Key figures of the deals in Romania are:

- In 2022, the volume of deals in Romania was €101.7 million, a 54.3% increase from 2021 after adjusting for outliers.
- The number of transactions increased by 3.5% from 71 in 2021 to 73 in 2022.
- The volume of series A transactions nearly tripled from €15.3 million in 2021 to €42.6 million in 2022 and the number of transactions doubled from 3 to 6.
- The total volume of seed transactions increased by 29% to €56.4 million in 2022, with an average deal size of €1.175.5 million.
- The pre-seed volume declined by 15.9% to €2.7 million with a decreased average deal size of €144.3K.

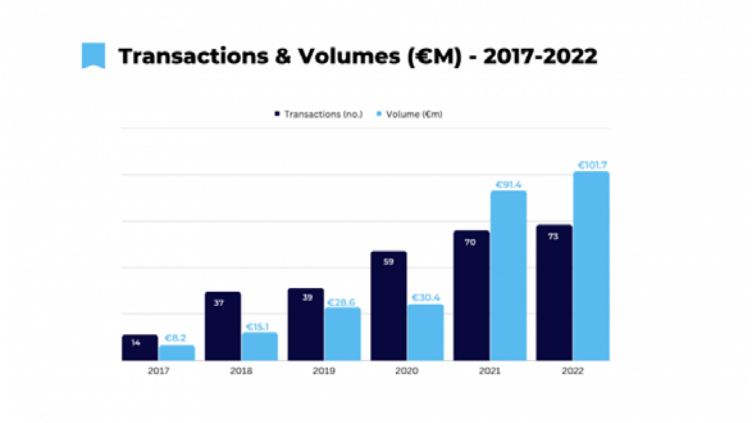


Figure no. 11. Evolution of Transactions and Volumes of venture deals
Source: ROMANIAN VENTURE REPORT 2022

Cluj-Napoca and Oradea - the main regional innovation hubs in North-West Romania

Cluj-Napoca has emerged as a key tech and innovation hub in Romania over the past decade. It is nicknamed as the "Silicon Valley of Romania" due to the development of the first IT clusters in the country. The city has witnessed a tremendous growth in the IT sector with 9% of the workforce employed in IT in 2020 as compared to 2% in 2008.

In 2020, Cluj-Napoca received recognition as a project leader in healthcare innovation and AI in Europe at the Global StartUp Summit. This growth has been supported by a well-developed network of startup community builders, tech events, accelerators, and local investors, leading to the birth of numerous startups and tech startups in the city.

Cluj-Napoca was named the leader in the "smart city development" category by Emerging Europe in 2021, based on its policies aimed at improving urban life. The city is participating in the European Commission's Cities Mission to become climate-neutral by 2030, alongside 111 other cities across the EU, with the potential to access the Horizon Europe fund programme.

Finally, Cluj-Napoca is also an R&D hub, attracting multinational companies in industries such as automotive and consumer electronics to set up R&D centers in the city, including Porsche Engineering and Bosch Engineering.

In **Oradea**, the second largest city in the North West region of Romania, both in terms of population and economic development, in 2020, small businesses made up the majority of companies in the city and were primarily involved in the services and commerce sectors, generating a revenue of €1.54 billion. Oradea had 22 startups with a local focus operating across 21 industries, present in 19 countries and employing over 300 people. Investments totaling over $9 million have been made in these startups. The local government has played a key role in the technological advancement of Oradea and the growth of its startup ecosystem. In 2020, a partnership between the private and public sectors was established with the aim of enhancing the local technology sector, supporting startups, and retaining IT and entrepreneurial talent.

Business incubators, accelerators and start-up support programmes

Innovation Labs[8] is a national pre-incubation and mentorship program for young technology entrepreneurs, reaching its 11th edition in 2023. Teams who will sign up for hackathons and participate in the Innovation Labs program can be, depending on the experience of their members, in one of three categories: teams made up exclusively of students, spin-off teams from university research projects, and teams made up of students and experienced entrepreneurs.

Based in Bucharest and Cluj-Napoca, **Techcelerator**[9] is an accelerator and investment partner for pre seed and seed-level hi-tech start-ups in acceleration and post-acceleration. Innovative young companies with high potential for development and international expansion in growing industries such as Fintech, B2B SaaS, eHealth, PropTech, cybersecurity, AI, digital transformation, etc., are targeted for acceleration and investment.

Techcelerator benefits from the strategic support of the GapMinder investment fund, Google for Startups and collaborates with a few other local and European investors to support the tech ecosystem in Romania and Southeast Europe. Techcelerator has supported over 240 start-ups through previous acceleration rounds and through various support programs, organized by itself or in partnership with other entities in the ecosystem.

InnovX-BCR[10] is an accelerator dedicated to technology businesses developing solutions for domains such as cyber-security, fintech, AI, machine learning, robotics, cloud, automation, or microservices. Businesses can sign up for the program in the following categories: Startups - companies with turnover or funding raised between €500,000 and €1 million, Scaleups - businesses with turnover or funding raised between €1 million and €5 million, developing innovative technology solutions and products. At the end of last year, the InnovX-BCR technology business accelerator completed its first program dedicated to venture capital investment funds in the Central and Eastern European region. Of the 14 teams participating in the program, 6 of them became alumni and are set to open venture capital funds with the aim of investing €155 million in technology start-ups in Central and Eastern Europe in the coming years, with a focus on the Romanian market.

The regional innovation ecosystem in the North-West region of Romania, is supported by a network of organizations and initiatives aimed at helping startups grow and succeed including technology companies, non-profit organizations, business intelligence companies, startup communities, angel networks, funds, accelerators, and co-working spaces.

Transilvania IT Cluster[11] is a network of IT companies that provides training and support for employees, while the **Romanian Tech Startups Association**[12] connects tech startups with key players in the ecosystem. **INNO**[13] , a department of the North-West Regional Development Agency, has launched in August StartUp LevelUP, an educational program that aims to initiate those who wish to enter the world of entrepreneurship. The program is organized in levels, with different themes and activities, which help the participants to develop, regardless of their stage. Business intelligence firm Activize.Tech[14] scouts,

8. https://www.innovationlabs.ro/
9. https://techcelerator.co/
10. https://innovx.eu/
11. https://www.transilvaniait.ro/
12. http://rotsa.ro/
13. https://inno.ro/en/home
14. https://activize.tech/

advises and matches startups with potential partners, and the community-focused Cluj Startups[15] , Fortech Investments[16] and Robin Good[17] help startups with their first steps. **The Transylvania Angel Network** [18] facilitates communication between startups and angel investors, and the pre-seed and seed fund **Risky Business Ventures**[19] invests in young tech founders. The **Spherik Accelerator**[20] offers startup programs at various stages, while RebelVentures operates as a corporate venture capital fund, reinvesting its parent company's revenue into startups. Cluj Hub[21] is a co-working space for entrepreneurs and freelancers.

As a conclusion Romania's venture investment scene is characterized by an increase in the value of initial private rounds, with fewer rounds being made below €200K compared to previous years. This indicates that startups are seeking more significant capital investments to support their growth. Although some small rounds may go unannounced, startups have access to grant programs that can help cover their initial capital needs, though they may not fully address the overall demand. Pre-seed investments are often made through convertible notes, and the raise period can last anywhere from 6-10 months, with some investors joining later with a lower level of risk. Angel investors are also a significant part of the investment landscape in Romania, with well-organized networks that are highly active in pre-seed and seed rounds. These networks have clear processes and strong communication, leading to a culture of co-investment among Romanian angel investors.

- Foreign direct investments

According to the National Trade Register Office, the North-West development Region ranked 3rd in Romania in 2019 in terms of the value of subscribed share capital and 3rd in terms of the number of companies with foreign equity participation registered.

According to the study conducted by the National Bank of Romania, the value of foreign direct investment (FDI) in the region was 4,610 million Euros in 2018, representing a share of 5.7% of the total FDI balance. Compared to the reference year, 2014, the region's investments increased by approximately 36.23%, a dynamic above the national growth rate (34.76%).

Of the total FDI in greenfield enterprises (investments made from scratch by foreign investors) registered at national level, in 2018 the region attracted 6.1% of the total investments of 51,150 million Euro, ranking fourth after Bucharest-Ilfov, Centre and West.

In terms of share in total FDI in the country, the position held by the North-West Region is constant (5th place nationally between 2008-2018), attracting, by the end of 2018, 5.7% of the total value of FDI in Romania. The top regions are Bucharest Ilfov (60.7%), Centre Region (9.0%), West Region (8.6%), South Muntenia (6.3%). The least attractive for foreign investors is the North-East Region (2.4%).

In the period 2014-2019, the registrations of companies with foreign shareholding registered a negative trend, their number decreasing by 11%.

15. https://clujstartups.com/
16. https://www.fortechinvestments.ro/
17. https://robingood.ro/
18. https://taninvest.ro/
19. https://riskybusiness.ro/
20. http://spherikaccelerator.com/
21. http://www.clujhub.ro/

Most companies with foreign capital in the North-West Region are concentrated in Cluj county, which for 2019 attracted 43% of investments (353 companies), respectively Bihor county - 32% (263 companies). The majority of foreign direct investments are concentrated in the municipalities of the county capital on the main road transport arteries. Their distribution is uneven, but their concentration in Oradea, Cluj-Napoca, Baia Mare and Satu Mare is mainly justified by their proximity to the Hungarian motorway network and air transport infrastructure.

At the national level, Cluj county ranks 3rd according to the number of companies with foreign contribution registered in the period 1991-2019, with a total of 10.340 companies (after Bucharest and Timis county). In terms of the value of subscribed share capital, Bihor county ranks 4th in the national ranking.

- Education environment

The development of the region can be based on qualified human resources, considering that in 2017 the percentage of students in the region's population was 3.65%, above the national average, the number of graduates in science, engineering and technology being 30.08%, percentage which places the region in third place after the Bucharest-Ilfov and North-East regions.

There are 8 **public higher education institutions** (HEIs) in the region, out of the 48 public HEIs on the national level. These also perform research and development activities. Their number is completed by 7 private universities with headquarters in the region that have accreditation, as well as subsidiaries of other 2 private accredited universities. Public universities lead in both student enrolments and research production, and are the only ones to enjoy institutional public funding. However, universities are comparatively new players in RDI and have been struggling to adapt to this new section of their mission after 1990. Their ties to industry, although gradually increasing in some aspects, remain weak overall. R&D activities in academia are rather irregular, depending only on project-based funding and on faculty's publishing efforts. Only 'teaching duties' are clearly defined for individual faculties in virtually all Romanian academia, so 'research duties' are more informally set at 25% of the former. For this reason, in official statistics the number of researchers in universities is estimated simply as the equivalent of 25% of all academic staff. The number of academic staff decreased by 11% between 2010 and 2015. One Romanian university has ever been included in the Shanghai top 500. Universities receive public institutional funding for teaching activities, but not for R&I. They finance their research via projects based on competitive funding, which is open to all R&I actors. Nevertheless, the research performance is a key factor in evaluating the universities and to some extent in quantifying their institutional funding. Also in terms of the share of people with tertiary education and/or working in the field of sciences and technologies in the total active population, the North-West Region has the lowest value for the entire period 2014-2019 compared to the reference regions.

New graduates provide opportunities for knowledge spillovers. Regarding the fields of education undertaken by the graduates, there was a trend during the last decade for obtaining social sciences and humanities degrees, which was reinforced by private higher education programmes [1, p. 60]. The most recent data for **tertiary education graduates** in North West Romania suggest that 51% of the graduates with a bachelor's degree, 38% of the graduates with a master's degree and 55% of the new PhDs in 2015 studied Natural Sciences, ICT, Engineering, Agricultural/Veterinary Sciences and Medical Sciences. In stricter terms, the percentage of the 2015 cohort of graduates with a STEM degree was 32.5% at the bachelor's level, 31% at the master's level, and 35.6% at the PhD level.

The percentage of **persons with tertiary education in the active population** at 20.2% is slightly above the national average of 19.6%, but still at 66% of the EU28 average. In practical terms, this means that the stock of human resources with qualifications that can potentially support innovative activity is low when compared to the EU average.

Regarding **students enrolled in higher education**, according to the INS, 95,046 students were registered in 2019 at the level of the North-West region. At the undergraduate level, their number increased almost constantly between 2014 (68,346 students) and 2019 (72,922 students), although at the national level their number decreased by approx. 1% in the same period.

In terms of the **number of students enrolled at bachelor's level**, the North-West Region ranks second nationally (national total of 407,373 students in 2019) after Bucharest-Ilfov, with a significant proportion of foreign students. The region ranks second (after Bucharest-Ilfov) also in terms of the number of **students enrolled in master's and doctoral or post-doctoral programs**, with 18,086 master's students out of 113,950 in 2019, respectively with 4,038 doctoral and post-doctoral students from total 21,976 at the national level.

According to the INS, in 2017 the **share of graduates in higher education** at the level of the North-West Region was 15.82% of the total of 124,759 graduates at the national level. This share places the region in second place in the national ranking.

The **share of technical graduates**, which include: engineering, manufacturing, construction, information and communication technologies, agriculture, forestry, fish farming and veterinary sciences, places the region in second place at national level, with 16.17%, after Bucharest-Ilfov (30 .78% of all graduates at the national level), increasing compared to 2014, when there was a weight of 15.61%.

A very important indicator in the context of intelligent specialization is the **population that graduated from tertiary education in the fields of science and technology (STEM)**. In absolute terms, the North-West Region registered, in 2019, 364 thousand people who graduated from tertiary education and/or work in the field of science and technology (signaling an increase of 18.5% compared to 2014). Compared to the active population, 26.4% have completed tertiary studies and/or work in the field of science and technology, placing the region above the national average (26.4%), but well below the values of the Bucharest-Ilfov region (53.7%).

- Research & Innovation

RDI % GDP - From the point of view of expenditure on research and development activity as a percentage of GDP, the region recorded decreases in the period 2014-2017, arriving in 2017 to hold the last place compared to the analyzed regions with only 0.24%. At the level of the North-West Region, the total expenses for CD activity increased in the period 2014-2018 by 18%, reaching a value of 54.4 million euros. At the same time, the region decreased from this point of view in the national ranking, in 2018 occupying only the 5th position in front of the Regions: North-East, South-West Oltenia and South-East, while in 2015 it was placed on 2nd place, after the Bucharest-Ilfov Region.

The value of R&D expenses per inhabitant recorded in the North-West Region has fluctuated in recent years, the maximum value being 29.3 euros/inhabitant in 2015, in 2013 being 19.8 euros/inhabitant and in 2017 21.1 euros /resident. This indicator places the region below the national average of 48.1 euros/ inhabitant in 2017 and well below the European average of 624.2 euros/inhabitant. At country level, the North-West Region ranks 3rd, after the Bucharest-Ilfov Region (268.6 euros/inhabitant) and the West (38.9 euros/inhabitant).

R&D Units - Economic development through innovation can be supported by R&D units - the region presenting the highest concentration of them after the Bucharest-Ilfov Region - and those of higher education in the region, including Babeș-Bolyai University in Cluj, the best-rated university in Romania internationally.

In the North-West Region there are 34 public research and development units, out of the total of 263 at the national level, respectively:

- 1 national research and development institute under the coordination of the Ministry of Research and Innovation
- 5 branches (of which 2 with legal personality) to which are added 2 research workshops of national research and development institutes based in the capital
- 5 institutes (of which 3 with legal personality) and 1 research center of the Romanian Academy
- 15 research stations with legal personality of the Academy of Agricultural and Forestry Sciences (ASA)
- 7 public universities, which bring together 15 prestigious institutes, 5 experimental research teaching stations, over 200 research centers and over 65 research laboratories
- 6 public health units located in Cluj-Napoca, with secondary R&D activities
- 2 branches without legal personality of the Academy of Medical and Technical Sciences respectively

The region stands out both at the national level and in comparison with other regions in Central and Eastern Europe, in terms of the number of higher education institutions (especially public) and the specializations offered. According to INS statistical data from 2019, the region ranks second in the national context, after Bucharest-Ilfov, in terms of the number of universities (13). There are 7 public universities in the North-West Region, out of 55 at the national level, and 6 private universities, out of 35 existing at the country level.

According to INS data, in 2019, there were 90 faculties in the region out of 546 at national level, the first place being the Bucharest-Ilfov Region with 157. The faculties in the region can be found in every county, most being in Cluj counties (49) and Bihor (22). Out of 407 faculties - public property existing at the national level, there are 70 in the North-West Region, compared to 95 in the Bucharest-Ilfov region. At the regional level, Cluj County ranks first, with 42 public faculties, followed by Bihor with 16.

The region hosts 7 top-performing advanced research public HEIs and around 15 public research organisations, ranking the region second after Bucharest-Ilfov in terms of number of HEIs, specializations and research institutes. Three non-public universities, with regional headquarters operate in Cluj-Napoca, 3 in Oradea, as well as one in Cluj-Napoca and Baia Mare.

The private research organisations represent a small minority. The SME sector typically does not perform R&I activities, as they are considered to be too risky, while several large multinational corporations have limited R&I activities in the region. Few high-tech sectors emerged recently, such as the ICT sector. According to data available through the ERRIS portal (erris.gov.ro), most of the region's research facilities and infrastructure is located in or around Cluj-Napoca (214), with Oradea (25) and Baia Mare (9) being the second and third poles, respectively.

The share of personnel involved in research and development in the total active population in the period 2014-2017 also decreased by 0.02 pp., reaching in 2017 the value of 0.266%, thus placing the region in 11th place out of 11 analyzed regions.

R&D employees - According to INS data, in 2018, in the North-West Region, 3,484 employees were active in units with CDI activity (of which 67% were researchers), representing 7.79% of the total number of employees in Romania in this sector. The North-West region ranks 5th in the national hierarchy in terms of this indicator.

In the same year, there were 29.5 employees from the CD activity compared to 10,000 civilian employed persons, the region occupying the 3rd place in the national hierarchy. At the NUTS 3 level, Cluj County ranks 6th in the national hierarchy (with 90.5 CDI employees/10,000 civilian employed persons), an aspect that can be correlated with the presence of the Cluj-Napoca University Center in the county.

The number of employees in the CDI activity in full-time equivalent in the region was 1,964 employees in 2018 (representing only 6.1% of the national total). The overwhelming majority is found in Cluj County (92%), followed by Bistrița-Năsăud County (4%).

Researchers - In 2018, the number of researchers in the North-West Region was 2,334, representing 8.5% of the number of researchers in Romania (a total of 27,471 researchers), the region ranking 4th in the national hierarchy after Bucharest-Ilfov (50.44% from Romanian researchers), North-East and West. In the period 2014-2018, there was an 18.96% increase in the number of researchers in the region, while the number of technicians and related personnel remained practically constant. Cumulatively, 77% of researchers in the region come from the public sector (government and public higher education) and 23% from the private sector (business and the civil sphere).

Innovation and Technology Transfer entities - At the national level, there are 37 innovation and technological transfer accredited entities and 10 entities provisionally accredited, according to the data provided on January 1, 2021.

The North–West region hosts 7 accredited ITT entities: CTT-CENTI IIT, CTT IPA CIFATT Cluj, CIT TEHNOINF BM, Industry Liaison Office CIVITTA OLI@ Cluj, Baia Mare Technological Information Center CIT-UTCN-CUNBM, Technological Transfer Center Oradea CNCG-CTT and Technical University of Cluj-Napoca and 2 provisionally accredited entities: Cluj-Napoca Municipal Hospital and INCDTIM Cluj-Napoca.

Patents - Regarding patent applications to OSIM, in 2018, 129 applications were submitted at the level of the North-West Region, representing 11.25% of the 1,147 applications submitted by Romanian applicants at the national level. Of the total number of applications submitted to OSIM, 31.65% were finalized by the issuance of patents, registering a slight decrease compared to 2014.

In the period 2014-2019, 213 patents were issued at the level of the region, Cluj County holding the largest share (over 70%), an aspect explained by the concentration of universities and research institutes in the region in Cluj-Napoca.

- Public authorities - innovation and digitalisation

In the public sector, digital technologies enable governments to operate more efficiently and to provide more citizen-oriented services. However, the increased pace of evolution technology, budget constraints, combined with the change in the demographic structure generate new challenges to which public authorities must find solutions. Use of technology of information and communications (ICT) and e-government strategies is now reaching new levels of maturity (eg: digital government), where technologies and user preferences are integrated into production and service delivery and are part of wider sector reforms public.

Public authorities must adopt measures to modernize the infrastructure to offer citizens an easy interaction with public platforms, both from the point of view of communication, as well as the use of the filling and uploading functions of the forms. In 2020, 12.4% of people between the ages of 16 and 74 interacted with public authorities via the Internet, at the level of the North-West Region.

Ghiseul.ro

The National Electronic Payment System (SNEP), also known as www.ghiseul.ro, is the system through which Romanians can pay their taxes online. The Ghiseul.ro system is administered and operated by the Agency for the Digital Agenda of Romania (AADR), an institution subordinate to the MCID. The online payment platform was made available free of charge by the Association for Electronic Payments in Romania (APERO). This is an association that promotes electronic payments and is made up of 14 major banks, international card schemes (VISA and MasterCard), processors and technology providers.

Since 2021, Cluj-Napoca has a **Digital Transformation Strategy** focusing on Smart living - integrating digital technologies in the community's life; Digital skills and digital inclusion, Interconnected digitalisation.

Since 2018, **Oradea municipality and metropolitan area has a Smart City Strategy**, addressing digitalisation of the public administration, as well as green and tourism components.

E-primariacluj

Cluj-Napoca City Hall uses new technologies to make Cluj-Napoca a more "intelligent" city in terms of solutions for the multiple problems that arise in an urban agglomeration, but also to give citizens the opportunity to express themselves and to offer effective solutions in the relationship with the local public administration.

Cluj-Napoca City Hall expands digital communication with citizens through the e-primariaclujnapoca.ro platform. The citizens of Cluj can thus create an account for digital communication of documents in relation to the City Hall on www.primariaclujnapoca.ro. The user account allows the communication and viewing – in digital format – of tax administrative documents, submission of applications, registration, online payment of fees and taxes, parking service, civil status documents and document issuance appointments.

1. Participatory budgeting - is a process initially launched by Cluj-Napoca City Hall and now adopted by Oradea and other cities in the country, through which the ideas and initiatives of the Cluj community are manifested and transformed into reality, using a platform for proposing and voting community project ideas to be financed and implemented by the city hall. It is an open, inclusive and transparent process through which community members are directly involved in formulating decisions regarding the priorities for spending money from the local budget.

2. Com'ON Cluj-Napoca - participatory budgeting for youth process, launched in the context of the Cluj-Napoca 2015 European Youth Capital program. The purpose of Com'ON Cluj-Napoca is to carry out a process facilitated by the generation, development, collection of community initiatives proposed and implemented by informal groups of young people in Cluj-Napoca and supported by public funds. The process is based on the principles of participatory budgeting. The strategic objective is to create a portfolio of at least 45 initiatives proposed by young people and addressed to the local community, initiatives that will contribute to the active participation of residents in community life, take place in public and community spaces and ensure free access without a financial barrier (ticket).

Com'ON Cluj-Napoca aims to involve young people from the local community in the development of the local community through a mechanism based on the principles of participatory budgeting. The mission of the Program is to strengthen the role and support given to young people and informal groups, formed by them in their active participation, in changing society through a process of sustainable, responsible and inclusive urban development.

The participatory process Com'ON Cluj-Napoca is implemented by the PONT Group and is primarily supported by the City Hall and the Cluj-Napoca Local Council. The Romanian Commercial Bank joins the participatory process by supporting the co-financing of the project.

3. Cluj-Napoca Civic Innovation and Imagination Center - The City Hall of Cluj-Napoca inaugurated the Civic Innovation and Imagination Center (CIIC) in October 2017, with a debate on the theme of the Railway Park - Competition for solutions for the rehabilitation of the park. Under the slogan "We imagine the future of the city!", the Center for Innovation and Civic Imagination has become a permanent laboratory in which to develop the various forms of collaboration between actors in the city.

Some of the main activities of CIIC are:

- Public consultations and participatory governance mechanisms. Since 2017, CIIC has been organizing public debates on various projects related to the development of the city of Cluj-Napoca. Starting in September 2022, with the support of the new CIIC Board, these public consultations will include new, interactive methods of debate.
- Cooperation with the university and private environment. CIIC aims to gather, in the future, all the positive energies of the city in an organized framework where these ideas can be analyzed and debated together with experts from the university and private sector.
- International cooperations. With the support of the Board, the CIIC team will develop clear international cooperation mechanisms with cities and networks of cities at European and global level, for exchange of experiences, best practices and collaboration.
- International competitions of solutions for city projects. The City Hall of Cluj-Napoca continues

its partnership with the Romanian Order of Architects for the running of solution contests and the identification of the best projects for Cluj's public space, through a validated procedure and based on selection criteria at European standards.

- Cluj-Napoca Innovation and Experiment Fund (FIX Cluj) is the result of a co-design process of the Cluj innovation ecosystem and is one of the projects aimed at encouraging and developing the city's human resources in the field of innovative entrepreneurship. It is a unique project in Romania, which helps young people from Cluj-Napoca to create innovative entrepreneurship initiatives, has entered a new stage. The first innovation fund dedicated to financing the entrepreneurial initiatives of young people from Cluj was launched at the end of 2021 by Cluj-Napoca City Hall, the C-EDU Education Cluster and the Botnar Foundation, being the result of a co-design process of the Cluj innovation ecosystem.
    - Currently, from 145 innovative proposals, received following the publication of a dedicated call in this regard during October 2022, 40 ideas have been selected to participate in the next stage of the project. The ideas were awarded by Cluj-Napoca City Hall with a first prize worth 3,000 euros. The teams are made up of young people aged between 16-26 who live, study or work in Cluj-Napoca.
    - The young people presented their ideas to their colleagues from the opposing teams during the first FIX Cluj event this year, FIX Kick-Off 2022, held online on January 26. By March 2022, the selected teams will undergo a training and mentoring program where they can improve their ideas, before presenting them again to the jury for a possible second round of funding of €12,000 under the program of social innovation. The program helps teams with grants of up to 50,000 euros to experiment, test and develop their innovative projects.

- Support actions for the implementation of the European Commission Mission "100 smart and climate-neutral cities by 2030". The CIIC Board will initiate and propose projects aimed at achieving climate neutrality objectives by 2030.
- Local level translation of the Sustainable Development Goals (SDGs) into investment programs and projects. With the help of the Board, the CIIC team will ensure the integration of the Sustainable Development Goals in local public policies, supporting the implementation of the city's green projects.
- ***Youth Advisory Council***. The CIIC Board will support the mechanisms of youth involvement in the decision-making process and the development of public policies for the youth sector. Also, the CIIC Board will support the implementation of the youth action plan "Cluj for Youth 2030", which combines a series of projects from the urban and metropolitan level.

4. Cluj Cultural Center (CCC) - is a non-governmental culture and sustainable development organization. The mission of the association Center is to mobilize culture, in partnership with other sectors, to contribute to social transformation and sustainable development.

- Conclusions - SWOT Analysis

Investment in Research, Development and Innovation is crucial for advance in science, for finding solutions to societal challenges for the development and use of impact technologies, quality of life, productivity and competitiveness, job creation and sustainability. Focused on value added and impact, this investment must have benchmarks for novelty, accountability, openness and sustainability.

Common, cross-cutting priorities of this investment, regardless of strategies and programmes, objectives and the sources of funding available to their implementation (national, NRPR, ESIF, etc.) or international (Horizon Europe, EU4Health, Digital Agenda, etc.) are: the human resource — developing, maintaining and attracting talents to create significant mass and capability in science; research infrastructure prepared for the challenges of open science to support experiments at the scientific frontier and provide technological and certification services; support private innovation, partnerships and technology transfer; concentration of resources and RDI capabilities in functional innovation ecosystems around smart specialisations and transitions.

The Romanian R&I system under-performs relative to the potential of the country and to its European peers, although several individual elements show excellent performance and high research quality. This system is too small compared to similar countries both in the number of individuals performing R&D activities and in terms of the size of R&D investments. At the same time there is a high number of public research units implementing R&D under MCID, ME, RA and a variety of other ministries, which makes the system complex.

STRENGTHS	WEAKNESSES
- Public and private research infrastructure and R&D-innovation activity well targeted in the region; - Cluj-Napoca is the research and development pole of the North-West Region; - High employment in high and medium to high tech manufacturing and high tech services knowledge - Increasing the number of researchers in region in the last 6 years; - There is a high proportion of women researchers; - Intensive research and development activity in higher education organisations and the sector government, underpinned by a high share of RDI spending, especially on industry and services; - The innovation and TT infrastructure is constantly developing; - Increased innovation capacity of product; - Increase in the percentage of people employed graduates of higher education institutions; - Steady growth of intelligence- intensive services such as R&D and ITC; - High density of SMEs; - Existence of strong clusters in areas of smart specialisation; - Increased digitisation and use of new techniques for managing information in public administration (e- government); - Information technology and computing remains a highly specific cross-cutting area in the region	- Low share of expenditure on R&D&I in regional GDP; - Low share of RDI expenditure in the private sector; - Low share of researchers in private sector in the region; - Low share of firms considered innovative and the need for an innovation policy mix; - Labour productivity is below the national average in all industries in apart from agriculture and information and communications; - Level of investment is below the national average and below the EU average; - Lack of dialogue and synergies between actions by public authorities and the private sector, in particular to develop business infrastructure; - Most companies in the IT and financial services in the region focuses on outsourcing activity; - Lack of an operational science and technology park in the region; - Low level of digitisation local governments; - Lack of involvement of interested companies

OPPORTUNITIES	THREATS
- European funding between 2021 and 2027 to encourage RDI; - Prospects for sustaining and developing research and innovation capacities and adapting advanced technologies; - Prospects for growth SME competitiveness and job creation through productive investment; - Funding for projects on skills development for smart specialisation, industrial transition and entrepreneurship; - A favorable EU legislative framework and political and financial support for emerging sectors such as energy renewable energy, cultural and creative industries, bio and nano-technologies, circular economy, etc.; - Existence of natural resources valuable in the region; - Existence of tourist attractions based on natural resources; - Existence of nationally and internationally recognised higher education structures for human resources training.	- High degree of co-financing requested under state/regional aid schemes for RDI projects; - Unfavorable national context for innovation; - Increased competition from imported products and services or from other regions of the country; - The decline of IT and financial services sectors specializing in outsourcing as a result of opening markets with cheaper labor; - Increased external migration, in particular in the young population; - Negative impact of Pillar II labour - Development of emerging sectors.