INNO Industry - Improving innovation delivery of policies within 4.0 industry in Europe.

INTRODUCTION: ROMANIA DIGITAL ECONOMY

Some Facts & Figures about Digitalization in Romania:

- Romania ranks 27th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019.
- 68% of internet users in Romania use internet on a daily basis;
- 21% of Romania citizens do not use internet at all;
- only 29% of people ages between 16 and 74 years have basic digital skills and 10% have advanced digital skills);
- ITC graduate: 4,9 % of all graduates (ranks 6th among EU countries);
- despite the existence of many skilled ICT specialists, the general workforce lacks digital skills with negative implications for increased labour participation.
- it ranks last in the EU regarding digital public services for business;
- best performance in the connectivity dimension, thanks to the wide availability of fast and ultrafast fixed broadband networks (especially in urban areas);
- broadband networks are underdeveloped in rural areas, with risk of digital exclusion and there are still rural areas with no access to the Internet;
- Romania is one of the world's leading countries in terms of internet speed.

The level of integration of digital technology by businesses

On the Integration of digital technology by businesses, Romania it is well below the EU average:

- the majority of businesses (more than 50%) have not yet invested heavily in digital technologies (i.e. have a very low DII-The Digital Intensity Index);
- enterprises are taking advantage of the possibilities offered by big data analysis (11 % versus 12 % EU average);
- use of cloud services 7 % in 2018, remains well below the EU average of 18%;
- 9 % of Romanian enterprises are using social media (versus 21 % EU average)
- only 8 % of total SMEs are selling online (against an EU average of 17%), while 2 % of them are selling online cross-border (versus 8 % EU average).

Source: Digital Economy and Society Index (DESI), 2019 Country Report Romania: European Commission;

Top 5 challenges of Romanian SMEs:

- General Data Protection Regulation (GDPR) 2018
- Lack of financial resources
- Lack of know-how to implement digital solutions
- Lack of clearly defined objectives / strategic vision
- Lack of implementation plan

Top 5 needs of Romanian SMEs:

- Consulting for implementation of digital transformation
- Better legal framework conditions
- Better IT infrastructure
- Data analytics, Big data know-how

1. Relevant Policies - Strategies and Funding Programmes – for clusters and digital transformation

1.1 Relevant Strategies (please list and if possible describe very briefly**):**

- **National Strategy on the Digital Agenda for Romania for 2020** adopted in February 2015.

The Digital Agenda defines the major role that the use of information and communication technology (ICT) will have to play in meeting the Europe 2020 objectives.

National Strategy for the Digital Agenda sets out four areas of action as follows:
1. e-Government, Interoperability, Cyber Security, Cloud Computing and Social Media - field which aims to increase efficiency and reduce costs in the public sector in Romania by modernizing the administration;
2. ICT in education, culture and health - field which aims to support these technologies at the sectoral level;
3. ICT in e-commerce, and **research, development and innovation in ICT** - area aimed at regional comparative advantages of Romania, and backs growth in the private sector;
4. Broadband and digital infrastructure services - aimed at ensuring social inclusion field.

The national strategy area of action 3" ICT in e-commerce, and research, development and innovation in ICT" is implemented through instruments as: Operational Program "Competitiveness" 2014-2020 Priority Axis 2 and the Regional Operational Program 2014-2020.

- **National Research, Development and Innovation Strategy 2014 -2020**

The National Research, Development and Innovation Strategy was approved in 2014.
The strategic objectives of NSRDI are as follows:
1. Increasing the competitiveness of the Romanian economy through innovation. The goal is to develop companies' ability to absorb state-of-the-art technology, adapt these technologies to the needs of serving markets, and develop technologies or services that enable them to progress on value chains.
2. Increasing the Romanian contribution to the progress of frontier knowledge. The strategy supports the increase of the international visibility of research and experimental development in Romania. The RDI activities at the frontier of knowledge imply the formation of a critical mass of researchers in the most promising areas, the maintenance of niche areas, international standards for research projects, and far-reaching scientific initiatives such as those developed around major infrastructures.
3. Increasing the role of science in society. Science and technology become relevant to society when their effects are felt in the everyday life of the citizens. The strategy aims to solve societal problems through innovative solutions.

   The strategy is implemented through a series of instruments, mainly through the National Plan for Research, Technological Development and Innovation 2015-2020 (PNCDI III) and the Operational Program "Competitiveness" - Priority Axis 1 "Research, Technological Development and Innovation for Business Support and Competitiveness" .

- **Regional Smart Specialization Strategies**

In Romania there are 8 development regions that developed their own RIS3. All the identified smart specialization fields in the regions match the areas identified in the National Research, Development and Innovation Strategy 2014-2020 and the National Strategy for Competitiveness 2015-2020.
The regional RIS3 strategies are focused on sectors such as: **ICT**, Wood and Furniture; Textiles and Leather, Automotive, Bio-economy, Health and Pharmaceuticals; Energy and environment Management; Tourism and Eco-tourism, Creative industries, Food and Beverage, Eco-nano-technologies and advanced materials. Information & Communication Technologies sector is included in S3 priorities of all regions.
The financing with the European funds in the next period 2021-2027 will be based on the smart specialization strategies.

- **National Competitiveness Strategy 2015-2020**

The National Competitiveness Strategy 2015-2020 is focused on 10 economic sectors with competitive advantage that are correlated with the smart specialization areas mentioned in the National Strategy of Research, Development, and Innovation 2014 -2020. The economic

sectors with competitive potential are: tourism and ecotourism, textiles and leather, wood and furniture, creative industries, automotive, information and communication technology, food and beverage processing, health and pharmaceuticals, energy and environment management, bio-economy (agriculture, forestry, fisheries, and aquaculture), biopharmaceutical and biotechnology sectors.

The financing with European funds for the period 2014-2020 is based also on this updated strategy.

- **Romanian Strategy for the development of SMEs and improving the business environment in Romania – 2014-2020.**

Priority areas of the strategy include: Support and promotion of entrepreneurship; SMEs access to adequate funding; Innovative SMEs; Access to markets and internationalisation of SMEs; and the Reaction of public administration to the needs of SMEs.

The financing of the activities of this strategy carried out with both national and European funds.

- **Romanian Industrial Policy (Document) –edition 2018** with the Cluster Policy as the main component is in line with the national interests and the revised European Union Industrial Policy (COM 479 / 13.09.2017: Investing in a smart, innovative and sustainable industry). The main directions of action provided by the Industrial Policy are in line with the INNO INDUSTRY project and mainly focused on: the development of an integrated and coherent policy to support innovative clusters to become clusters of excellence and world class; on the elaboration of the national smart specialization strategy and correlation with the future programming period (2021-2027); on the financing programs for increasing innovation in manufacturing processes as well as financing schemes dedicated to implementing new innovative concepts and technologies (industry 4.0, 3D printing, open innovation, etc.); on the development of a National Program to Increase Cluster Economic Competitiveness and of the Research Plan for Industry etc.

The financing of the activities mentioned in the related Action Plan will be carried out between 2021-2027 with both national and European funds.

- **Romania's Sustainable Development Strategy 2030 – Goal 9: Industry Innovation and Infrastructure** is focused on stimulating in particular of the digital economy and investment in industries which are at the more profitable end of the value chain, which utilize the results of national efforts in the area of research, development and innovation, and which target stable and growing markets. The Strategy has the following aims: to encourage development of quality, viable, safe, and sustainable infrastructure to support economic development and well-being for all; to integrate small and medium-sized enterprises in value chains and on external markets; to modernize infrastructure and rehabilitate industries for the efficient use of resources by adopting clean and ecological industrial processes and technologies; to strengthen scientific research, by significantly increasing the number of employees working in research and development, and to collaborate with the private sector; to modernize the technological capacity of the industrial sectors and to encourage innovation.

1.2 Relevant policy instruments/funding programmes (please list and if possible describe very briefly**):**

1.2.1 Funding instruments available on national level

- **National Plan for Research, Technological Development and Innovation 2015-2020 (PNCDI III)**

The National Plan for R & D and innovation is the main instrument for implementing the National Strategy for Research and Innovation 2014-2020 and includes five programs: One of the program is “Increase competitiveness of the Romanian economy through research, development and innovation”(projects will be considered by providing support for the development of models /product solutions, technologies, methods, systems, new or significantly improved services, the implementation of prototypes/pilot plants support for outsourced research in partnership with public research organizations, to commissioning production/implementation/operation of products, technologies/new systems to the economic operator or another category of beneficiary of the project etc). **This national plan with Program 2 –Increasing the competitiveness of the Romanian economy through research-development-innovation has as financing instrument for cluster management the “Organization and creation of cluster-Innovative Cluster program.**

- **Operational Program "Competitiveness" 2014-2020** will address the challenges stemming from the low support for research, development and innovation (RDI) and the under-developed information and communication technologies (ICT) services and infrastructure.

Funding priorities:

Priority Axis 1 **"Research, Technological Development and Innovation for Business Support and Competitiveness** .The main direction of investment in RDI is to build a more compact and modern R&D environment that focuses on the businesses' needs. It will reinforce the RDI capacity of the country (resources and infrastructure), boost private investments in RDI, develop centres of excellence, strengthen the links between businesses and research institutions, and stimulate the creation of networks and clusters for developing new products and services. **Specific objective: Increasing scientific capacity in the fields of smart specialization and health Action 1.1.1 Large research development infrastructures-type of project: Innovative clusters 1st and 2nd calls 2019**

Priority Axis 2:" **Information and communication technologies for a competitive digital economy .**

In the area of ICT, the programme covers four main areas for development: a) e-government, interoperability, cyber-security, cloud computing and social networks, b) use of ICT in education, health, social inclusion and culture **c) e-commerce, clusters and developing innovation through ICT** and d) further deployment of the broadband infrastructure for the whole country.

- **The Regional Operational Programme 2014-2020**

The Regional Operational Programme addresses the major development challenges for Romania: regional competitiveness,sustainable urban development, the low-carbon economy, and economic and social infrastructure at regional and local level.

Funding priorites

Priority Axis 1: Promoting technology transfer (supporting transfer of technology and innovation take up by SMEs in areas for smart specialisation).

Priority Axis 2: Enhancing SMEs' competitiveness (focusing on Romania's high-growth economic sectors).

- **Others funding instruments for SMEs**

Start up Nation programme; UMCTAD-EMPRETEC programme for Romania; The Romanian-Swiss program for SMEs;Romania HUB (supports the creation of a common platform for developing entrepreneurship).

1.2.2 Funding instruments available on EU level

Romania has committed to invest in digital technologies, via EU-coordinated programmes. The country is a member of the EuroHPC Joint Undertaking; it has also signed the Declaration

creating the European Blockchain Partnership and the Declaration on Cooperation on Artificial Intelligence; Horizon Europe, Interreg, LEADER, etc.

1.3 SWOT

STRENGTHS:

-Clusters play an important role in developing and implementing all these strategies. Since its foundation in 2011, the Romanian Cluster Association (CLUSTERO) worked in close cooperation with the Ministry of Economy(ME) in shaping up the Romanian cluster landscaped acting as an intermediate body between the policy level (ME) and clusters themselves and as a consultant in the elaboration of programmatic documents concerning cluster policy. CLUSTERO is also a representative body for clusters at European and international levels. In Romania there are 72 clusters out of which 18 clusters are labelled with gold, silver and bronze and other clusters are in recertification. 15 clusters are active in ICT sector and offer services for their members and non-IT clusters. All ministries involved in cluster policy or digital transformation cooperate with CLUSTERO for implementing these strategies/policies.

- The national and regional strategies and funding programs are coordinated /implemented by ministries, regional development agencies as well as all relevant intermediaries in the regions.

-The Digital Romania International Forum is the highest-level annual meeting of decision-makers and industry leaders in Romania. Forum is the place where top stakeholders set Romania's digital agenda for the year to come, in consultation with European Commissioners, Heads of State, and Romania's strategic partners.

-The automotive industry that is a smart specialization sector will leverage the most resources and makes the largest investments in digitalization. In the last 10 years, this industry mentioned in these strategies has developed strongly in Romania. The number of automotive suppliers in Romania is constantly increasing. Of the top 20 global automotive suppliers, 13 are present in Romania with production facilities and cluster founders (Dacia Renault, Ford, Continental etc). Germany is the main supporter of the Industry 4.0 strategy and represents one of the largest investors in Romania. Many German companies already have state-of-the-art technology in our production facilities.

-The speed of the Internet connection in Romania is one of the highest in Europe. The Internet of Things will generate a huge amount of data and so it will need very high speeds for transfer and processing. The skills needed for the digital factory can be found in Romania. There is a tradition of production and good technical universities, the proof being the numerous investments in R&D centers, Digital Innovation Hubs etc.

-The IT sector is a well developed in Romania and can support the investors' efforts in digital factories. (i.e. The main purpose of Transylvania IT Cluster is to offer digitalizing services for different industries through its members by supporting innovation development within IT companies, by offering digitalization services for non-IT industries).

WEAKNESSES:

-These strategies are not linked to each other. There is a fluctuation of policy makers and experts in the management authorities and a low communication between policy makers in charge for different strategies and funding programmes.

-The policy instruments are effective but insufficient accessed by clusters due to the conditions imposed by the guides of applicant that do not take into account the economic reality (i.e. too high co-financing etc).

OPPORTUNITIES:

-The development of the industry driven research and a strongly involvement of clusters in the regional innovation eco-system will have a stimulating role for the local/ regional development (i.e. smart cities).

-The introduction of more fiscal facilities for the companies which invest in the research, development and innovation activities and the development of new sectors with competitive

regional advantages such as the ITC sector will be also opportunities for implementing these strategies.
-Dissemination of relevant Romanian policies for clusters and Digital transformation within the European Cluster Expert Group of European Commission in view to increase international visibility and exchange of best practices.

THREATS
-The non-adequate use of the financing sources stipulated by the strategies and programs
-The migration of the specialists towards other countries.
- Cyber attacks.

1.4 What do we want to improve?
-Improved governance in terms of clearer allocation of tasks and responsibilities for cluster policy within the Directorate for Industrial policy of the Ministry of Economy;
-Elaboration of a national strategy for transition to industry 4.0 with financing instruments stipulated in the Regional Operational Program and Operational Program Competitiveness 20121-2027;
-Elaboration of a National Strategy for developing Digital innovation Centres in the 8 development regions;
-Elaboration of a self-standing strategic cluster policy document and according implementation instruments (Regional Operational Programs for the smart specialization sectors that will mention measures for animation, digital transformation, internationalization etc; more financing programs for clusters and digitization of companies);
-Support for innovation clusters in the field of ICT systems and of research infrastructure
-Training measures and exchange of best practices in Industry 4.0 with clusters from EU
-Support for European innovation partnerships focused on digital transformation.

1.5 Are there any best practices related to our policies that we want to offer to the INNO Industry partners?
-Digital Romania International Forum (https://see40.org) that is an annual event had as main topic" in 2018: "Women Leadership in the Industry 4.0.
At European level, Romania enjoys the second highest rate of representation of the female segment in the digital sector (25,7% compared to the EU average of 16,2%).
The three panels of this edition focused on topics of interest for the digitization agenda. The future of Work and Production discussed with industry seniors digital skills, both elementary and advanced, the components of future workforce, production in the era of Industry 4.0 as well as the future of formal education and entrepreneurship. The Future of the Human Body, Health and Mind panel discussed digitization in health, evolution in e-health through the application of innovative technologies but also how the future could look for the human mind and body. The Future of Security panel analyzed at national, European but also transatlantic level, potential threats in the cyber space, aiming to secure the digital future.
At each of the forum editions there were sections dedicated to policies in the field of digital transformation and industry 4.0 (smart factory).
Clusters and CLUSTERO participated at all these events and proposed to create a virtual investment fund focusing on start-ups and scales in key digital fields: artificial intelligence, block chain, cyber security and e-health as well as a program "Every Girl Every where" aimed at increasing the female participation rate in the digital domain in Romania for the coming years.

2. (Financial and non-financial) Support for Companies for Digital Transformation
2.1 Relevant Support for companies for Digital Transformation (please list and if possible describe very briefly**):**

Financial support

- **Operational Program "Competitiveness" 2014-2020**

Priority Axis 2. Information and communication technologies for a competitive digital economy

In the area of ICT, **Operational Program "Competitiveness" 2014-2020** covers four main areas for development: a) e-government, interoperability, cyber-security, cloud computing and social networks, b) use of ICT in education, health, social inclusion and culture **c) e-commerce, clusters and developing innovation through ICT** and d) further deployment of the broadband infrastructure for the whole country.

Investment Priorities of Priority Axis 2:

2.1. Extending broadband deployment and diffusion of high-speed networks and supporting the adoption of emerging technologies and networks for the digital economy; digital inclusion, e-health and online culture

2.2. Development of ICT products and services, e-commerce and enhancing demand for ICT;

2.3. Strengthening ICT applications for e-government, e-learning

Investment priority: 2.2. Development of ICT products and services, e-commerce and enhancing demand for ICT has Action 2.2.1 for companies:

• Action 2.2.1 Support the growth of the added value of ICT and innovation in the field by developing clusters

Main objectives of Action 2.2.1:

Increasing competitiveness of SMEs
Strengthening cooperation structures between companies or between industry and science/research Fostering innovation capacity
Fostering R&D activities, technology development and implementation
Strengthening innovation ecosystems in specific regions
Supporting internationalisation activities
Promoting entrepreneurship, start-ups and spin-offs
Promoting scale-ups
Supporting excellence of cluster members

Eligible applicants:

- SME-s operating in Romania, focused on ICT or who operates as members of clusters focused on ICT;
- Partnerships between SME-S operating in Romania, members of clusters focused on ICT.

- The tax exemption provided for IT professionals

Non-financial support

Workshops organised in 2019 by private companies (https://factory40.ro) in the field of industry 4.0 (automation, big data & analytics, cloud services, internet of things, simulations of reality, systems integration, augmented analytics, cyber security, print 3D). 330 people and 180 companies attended these free workshops.

2.2 SWOT

STRENGTHS:

The support through the Operational Program "Competitiveness" 2014-2020 Priority Axis 2 targets the development of innovative ICT products / services / applications through:

- Investments in tangible and intangible assets within an initial investment;
- Investments in industrial research and experimental development;
- Investments in projects for innovation of SMEs;

- Investments in projects regarding process and organizational innovation;
- Minimis aid: market research expenditure, information and publicity, consultancy, notice, authorizations, training, audit, management, subscriptions, etc.

The amount of non-reimbursable funding is: between **500.000 euro** and **3.500.000 euro**
Financing percentage:

- For activities from a) to d): between 20% and 80% of total eligible costs, differentiated according to project activities, the size of the company and the region where it is being implemented.
- For minimis aid – point e): 100%, maximum 200.000 euro and no more than 20% of the total eligible costs of the project.

Project duration: maximum 36 months.

WEAKNESSES:
-Too high co-financing for our SMEs and few SMEs accessed this program;
-No training/skills development projects for digital transformation; development of new business models.
-The level of investment in innovation and technological transfer is still low in the cluster enterprises.

OPPORTUNITIES:
-The digital transformation enables companies to refine their business models digitally;
-Clusters offer for SMEs members opportunities to improve their products and services through digitalization.

THREATS:
-Emphasizing the lack of high skill workforce;
-Legal framework conditions: data security, GDPR.

2.3 What do we want to improve?
-Financing of Digital transformation through clusters within the new Regional Operational programs 2021-2027;
-Increasing public funding for collaborative projects and actions of clusters members in view to support SMEs in integrating into Industry 4.0 and global value chains

2.4 Are there any best practices that we want to offer to the INNO Industry partners?
-A Program for financing pilot projects for digitization of SMEs, both directly through micro-grants (5000-15000 euro) and by clusters, or through cascade funding (the project Digitalise SME https://digitalisesme.eu/ro/home-8/ carried out by Cluster for Innovation and Technology

3. Support for Cluster Management Organisations (or similar organisations)

3.1 Relevant Support for cluster management organisations (please list and if possible describe very briefly**):**

- **National Plan for Research, Technological Development and Innovation 2015-2020 (PNCDI III)**

The National Plan for R & D and innovation is the main instrument for implementing the National Strategy for Research and Innovation 2014-2020 and includes five programs: One of the program is “Increase competitiveness of the Romanian economy through research, development and innovation”(projects will be considered by providing support for the development of models/product solutions, technologies, methods, systems, new or significantly improved services, the implementation of prototypes/pilot plants support for outsourced research in partnership with public research organizations, to commissioning

production/ implementation/operation of products, technologies/new systems to the economic operator or another category of beneficiary of the project etc).

This national plan with Program 2 –Increasing the competitiveness of the Romanian economy through research-development-innovation with the financing instrument "Organization and creation of cluster-Innovative Cluster financed the management of clusters.

- **Operational Program "Competitiveness" 2014-2020** will address the challenges stemming from the low support for research, development and innovation (RDI) and the under-developed information and communication technologies (ICT) services and infrastructure.

Funding priorities:
Priority Axis 1 **"Research, Technological Development and Innovation for Business Support and Competitiveness** .The main direction of investment in RDI is to build a more compact and modern R&D environment that focuses on the businesses' needs. It will reinforce the RDI capacity of the country (resources and infrastructure), boost private investments in RDI, develop centres of excellence, strengthen the links between businesses and research institutions, and stimulate the creation of networks and clusters for developing new products and services. **Specific objective: Increasing scientific capacity in the fields of smart specialization and health Action 1.1.1 Large research development infrastructures-type of project: Innovative clusters 1st and 2nd calls 2019**

3.2 SWOT

STRENGTHS:
-The cluster management is supported both by public and European financial programs and non-financial services offered by CLUSTERO and by others clusters.

WEAKNESSES:
-There are few financial programs for cluster management and not in accordance with their needs inclusively for digital transformation.

OPPORTUNITIES:
-Active participation in consortia for European programs and exchanges of good practices on digital transformation

THREATS:
Slow reaction of cluster management to global/regional change, fragmented approach, reduction of investments and innovation.

3.3 What do we want to improve?
-Increasing public funding for cluster management in the next programming period 2021-2027;
-Specific calls for cluster management to be specified both in the Operational programs and in the European programs (Horizon Europe; COSME etc)

3.4 Are there any best practices that we want to offer to the INNO Industry partners?
- Cluster Bridge Scheme (support for cluster management/capacity building, development of services, etc. financed from national budget.

4. Main players: coordination & interaction in triple helix

4.1 Main players for clustering and digital transformation in the triple helix:

- National policy makers (Ministry of Economy, Energy and the Business Environment, Ministry of Education and Research, Ministry of Public Works, Development and Administration, Ministry of Environment, Waters and Forests, Ministry for Transport, Infrastructure and Communications, Ministry of European Funds) create the framework for cluster development and the digital transformation being support institutions; ICT outcomes can be negative if not backed by adequate policies/strategies.
- Regional Development Agencies are intermediary bodies and support organizations and in the next period will be management authorities for the Regional Operational Programs;
- Municipalities are support institutions for the regional innovation eco systems
- Clusters facilitate the digital transformation within SMEs members and the cooperation with the research and development entities; internationalization and exchanges of best practices with other clusters from abroad;
- Research and development organisations, universities;
- Business organisations inclusively multinationals;
- Digital Innovation Hubs;
- Business Incubators;
- CLUSTERO-Romanian Cluster Association
- ARIES-Romanian Association for Electronic Industry and Software;
- ANIS-Employers' Association of the Software and Services Industry;
- Chambers of Industry and Commerce
- Technology Transfer Centres.

Relevant platforms on national level

National Coalition for Digital Skills and Jobs[1] - Skills4IT. This open platform includes several stakeholders and has political backup from several ministries. Activities are focusing on rolling out coding and IT classes in schools, organising cyber security courses and educational events.

4.2 SWOT

STRENGTHS:

-Close collaboration of national/ regional/ local policy makers with intermediaries and clusters in the regions (involvement in strategy development and implementation);
- Involvement of IT clusters in digitalization of non IT SMEs and clusters;
-Presence of clusters networks and digital platforms to inform each other about policies, strategies, available financing, export opportunities, national and international events etc.
- In October 2018, the University of Bucharest, together with Google Romania, launched an innovation hub for digital skills, the Google Digital Workshop hub.

WEAKNESSES:

-Insufficient collaboration between players and overlaps of activities of different organizations.

OPPORTUNITIES:

-the decentralization mechanism for the period 2021-2027 (Regional Development Agency will become management authority for Regional Operational Programme, that will finance also relevant clusters for smart specialization area in the regions;
-financing of clusters with role of digital innovation hubs in the regions through Operational Competitiveness Programme;

THREATS:

- merger or dissolution of public institutions due to political and conjunctural factors.

[1] https://ec.europa.eu/digital-single-market/en/national-local-coalitions

4.3 What do we want to improve

- Better coordination and cooperation of ministries to support clusters by public and European funds as well as digitization of companies.

4.4 Are there any best practices that we want to offer to the INNO Industry partners?

- Romanian Cluster Competitiveness Platform by CLUSTERO (see description in best practice template)

5.Cluster activities/services to support digital transformation

5.1 Examples of successful services/activities (please list and if possible describe very briefly**):**
-Cluster Innovation and Technology -A Program for financing pilot projects for digitization of SMEs, both directly through micro-grants (5000-15000 euro) and by clusters, or through cascade funding (the project Digitalise SME https://digitalisesme.eu/ro/home-8/
-Transylvania IT Cluster –Collaborative Platform for Clusters and their members-a prototype presented at the Transylvanian Clusters International Conference held in September 2019 in Cluj Napoca
-INOMAR Cluster- INFRANET CYBERPORT – A Secure by Design Maritime Digital Platform which enables better port governance and public-private interoperability (see description in best practices template);
-**IMAGO-MOL cluster:** -USMED AND SURGERY ASSIST-Software Medical Assistants for the Medical Imaging Sector in the North East Region of Romania (see description in best practices template);
-**MECHATREC Cluster** has designed and realized since 2010 concepts, syntheses, principles, models, intelligent architectures, modular constructions and mechatronic products and Cyber-Mix Mechatronics for Industry 4.0, now many of them have already been technologically transferred and implemented in industry (i.e the automotive industry-Renault Dacia; in the medical industry-Laser Selection Sintering Technology; in the aerospace industry-Mechatronic Systems for Measuring Telemetry of Positioning and Relative Distances between Microsatellites; in the intelligent agricultural industry-robots in systems integrated with drones etc);
-**ANTREC Alba EMC for Transylvania Lands Cluster**-Transylvania Info Portal - the development of e-tourism for the tourism industry in today's knowledge society, through digital guidance and digital localization.

5.2 SWOT

STRENGTHS:
-The successful cluster services are available also for other clusters and industrial sectors.

WEAKNESSES:
-Lack of broad visibility of these services among SMEs and clusters;
-Lack of understanding by SMEs of what digitalisation means;
-Lack of digital skills and financing

OPPORTUNITIES:
-Make better use of universities where IT clusters are active.
-Increased international visibility (example:platform “Extreme Light Infrastructure - Nuclear Physics (ELI-NP)”.

THREATS:

-Lack of financing for digital transformation until being operated the next European financial programs 2021-2027;

5.3 What do we want to improve?

-How to manage digital transformation by SMEs;
-How can clusters help companies to develop new business models in digitalized world;

4.4 Are there any best practices that we want to offer to the INNO Industry partners?

-CLUSTERO Romanian Cluster Competitiveness Platform (see description in best practice template);
-**IMAGO MOL Cluster** -USMED AND SURGERY ASSIST-Software Medical Assistants for the Medical Imaging Sector in the North East Region of Romania (see description in best practice template);
-**INOMAR Cluster** – INFRANET CYBERPORT –A Secure by Design Maritime Digital Platform which enables better port governance and public-private interoperability (see description in best practice template);
-**ANTREC Alba EMC for Transylvania Lands Cluster**-Transylvania Info Portal - the development of e-tourism for the tourism industry in today's knowledge society, through digital guidance and digital localization

1. SWOT Overview

Please summarize SWOT in key words

Dimension	Strengths	Weaknesses	Opportunities	Threats
Policies	• clusters play an important role in developing and implementing the strategies. • the national and regional strategies and funding programs are coordinated /implemented by ministries, regional development agencies as well as all relevant intermediaries in the regions. • The Digital Romania International Forum is the highest-level annual meeting of decision-makers and industry leaders in Romania. • the automotive industry makes the largest investments in digitalization. • the speed of the Internet connection in Romania is one of the highest in Europe. • IT sector is a well developed in Romania and can support the	• these strategies are not linked to each other. Fluctuation of policy makers and experts in the management authorities and a low communication between policy makers in charge for different strategies and funding programmes. • the policy instruments are effective but insufficient accessed by clusters due to the conditions imposed by the guides of applicant that do not take into account the economic reality (i.e. too high co-financing etc).	• the development of the industry driven research and a strongly involvement of clusters in the regional innovation eco-system. • the introduction of more fiscal facilities for the companies which invest in the research, development and innovation activities and the development of new sectors with competitive regional advantages (IT sector). • dissemination of relevant Romanian policies for clusters and Digital transformation within the European Cluster Expert Group of European Commission to increase international visibility and exchange of best practices.	• the non-adequate use of the financing sources. • the migration of the specialists towards other countries. • Cyber attacks.

	investors' efforts in digital factories.			
Support for companies / cluster members	• Funding programme: " Operational Program Competitiveness" 2014-2020 Priority Axis 2 targets the development of innovative ICT products / services / applications.	• too high co-financing for our SMEs and few SMEs accessed this program; • no training/skills development projects for digital transformation; development of new business models. • the level of investment in innovation and technological transfer is still low in the cluster enterprises.	• the digital transformation enables companies to refine their business models digitally; • clusters offer for SMEs members opportunities to improve their products and services through digitalization. • free workshops in the field of industry 4.0 organised by private companies in 2019.	• the lack of high skill workforce; • legal framework conditions: data security, GDPR.
Support for cluster management	• public and European financial programs; • non-financial services offered by CLUSTERO and by others clusters.	• few financial programs for cluster management and not in accordance with their needs inclusively for digital transformation.	• active participation in consortia for European programs and exchanges of good practices on digital transformation	• slow reaction of cluster management to global/regional change, fragmented approach, reduction of investments and innovation.
Interaction of main players	• close collaboration of national/ regional/ local policy makers with intermediaries and clusters in the regions. • a National Coalition for Digital Skills and Jobs9 - Skills4IT10;	-insufficient collaboration between players and overlaps of activities of different organizations.	• the decentralization mechanism for the period 2021-2027; • financing of clusters with role of digital innovation hubs in the regions through Operational Competitiveness Programme;	• merger or dissolution of public institutions due to political and conjunctural factors.

Cluster Activities	• cluster services are available also for all industrial sectors.	• lack of broad visibility of cluster services among SMEs; • lack of understanding by SMEs of what digitalisation means; • lack of digital skills and lack of financing.	• make better use of universities where IT clusters are active. • increased international visibility.	• lack of financing for digital transformation until being operated the next European financial programs 2021-2027;

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