

THE INTELLIGENT SPECIALIZATION MECHANISM PROPOSED BY ROMANIA FOR ECONOMIC GROWTH

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Abstract: *The concept of smart specialization aims to provide the necessary context for substantiating investments in research, development and innovation through EU cohesion policy.*

Smart specialization requires a strategic and integrated approach, which aims to capitalize on the potential for smart growth and the knowledge-based economy in all regions.

EU states are committed to developing a smart national specialization strategy as part of the Europe 2020 Agenda for Growth.

In this regard, one of the essential conditions for the use of funds allocated through cohesion policy 2021-2027 was the development of a clear and well-designed mechanism in the field of research and innovation, to guide how investment funds can be used in the next 7 years. and to ensure that clear objectives are achieved.

Key words: *smart specialization, smart growth, economic growth, research, development and innovation*

1. Introduction

Considering the current context related to the new trends regarding the transition to a new stage of digitalization, in Romania have been identified the priority areas in which it is necessary to intervene to facilitate interventions. [2]

In this sense, at the Romanian level, the national investment priorities necessary to be financed from the European Funds post-2020 but also from the national funds were identified, which should be the basis of the Integrated Intelligent Specialization Mechanism proposed by Romania for economic growth in the period 2021-2027.

Thus, in relation to the national priorities identified for funding, priority intervention objectives have been set. At the level of each priority objective, general objectives, specific objectives and measures for their fulfillment were established.

For the period 2021-2027, Romania has set itself the following five priority objectives:

1. A smarter Romania;

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2. A more connected Romania;
3. A more social Romania;
4. A greener Romania;
5. A Romania closer to its citizens. [3]

Thus, in order to fulfill the priority objective 1. A smarter Romania, several general and specific objectives have been proposed as well as the necessary measures to be implemented in order to facilitate the transition to a Romania based more and more on a smart specialization, respectively:

General and specific objectives:

OG 1. DIGITALIZATION

OS: Harnessing the benefits of digitalisation for the benefit of citizens, companies and governments

OG 2. COMPETITIVENESS

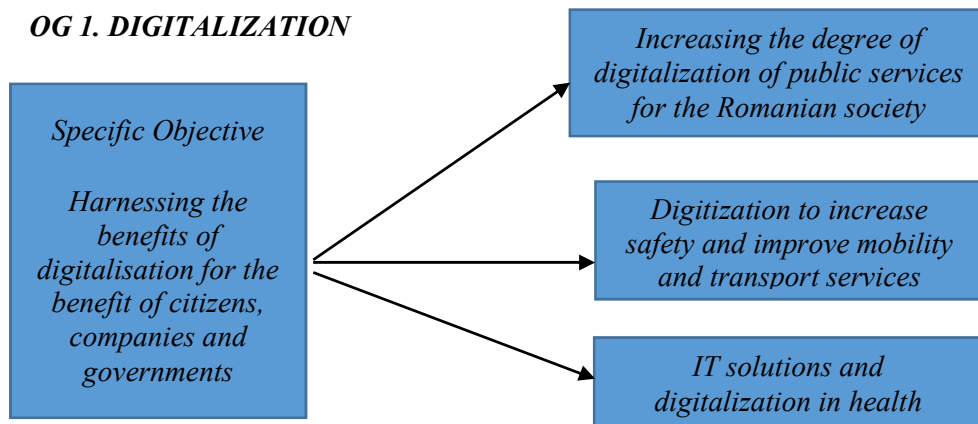
OS: Research and Innovation - Boosting the growth and competitiveness of SMEs

OG 3. RESEARCH AND INNOVATION

OS: Development of research and innovation capacities and adoption of advanced technologies

OG 4. INTELLIGENT SPECIALIZATION, INDUSTRIAL TRANSITION AND ENTREPRENEURSHIP

OS: Development of skills for smart specialization, industrial transition and entrepreneurship



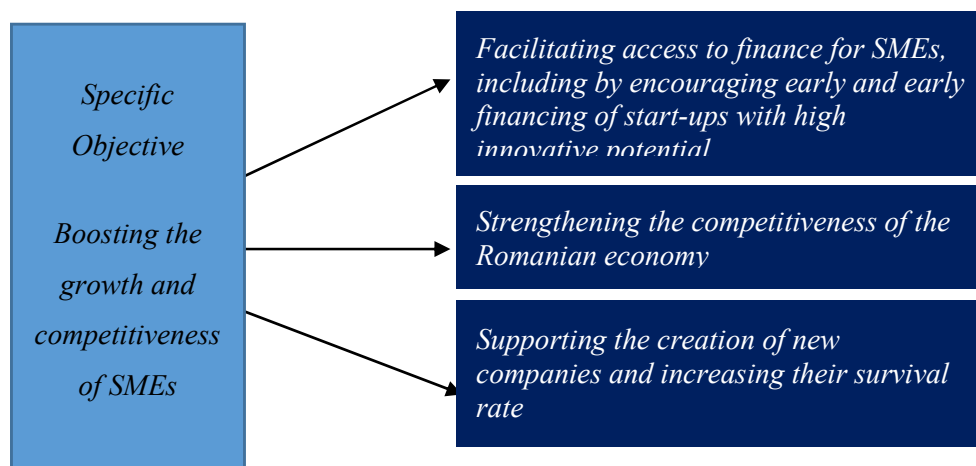
In this sense, for the fulfillment of the general and specific objectives, concrete measures and sub-measures were proposed, each of them being financially supported with the help of local, regional or national interventions but also European ones, respectively:

- For the measure: *Increasing the degree of digitalization of public services for the Romanian society*, the following sub-measures were established:
 - Implementation of measures for the development of e-government services (life events) - national interventions
 - Digitization and advanced digital skills in public administration - national interventions
 - Digitization of public services at local level - regional interventions

For the measure: *Digitization to increase safety and improve mobility and transport services*, the following sub-measures have been established:

- Development of digitization tools to improve safety and security for all modes of transport - national interventions
- 6.2 Financing of digitization tools, including implementation of ERTMS / ETCS, RIS / VTMS systems for all modes of transport - national interventions
- For the measure: *IT solutions and digitization in health*, the following sub-measures were established:
 - Restoration and modernization of the information system (CNAS) - national interventions
 - National Observatory for Health Data - (Construction, equipment acquisition / development of information systems) - national interventions
 - Soluții digitale în infrastructură din sănătate (digitizare internă și externă a instituțiilor medicale) – intervenții naționale,
 - Standardization of information flows (up-grade software, development of information systems / equipment acquisition - national interventions.

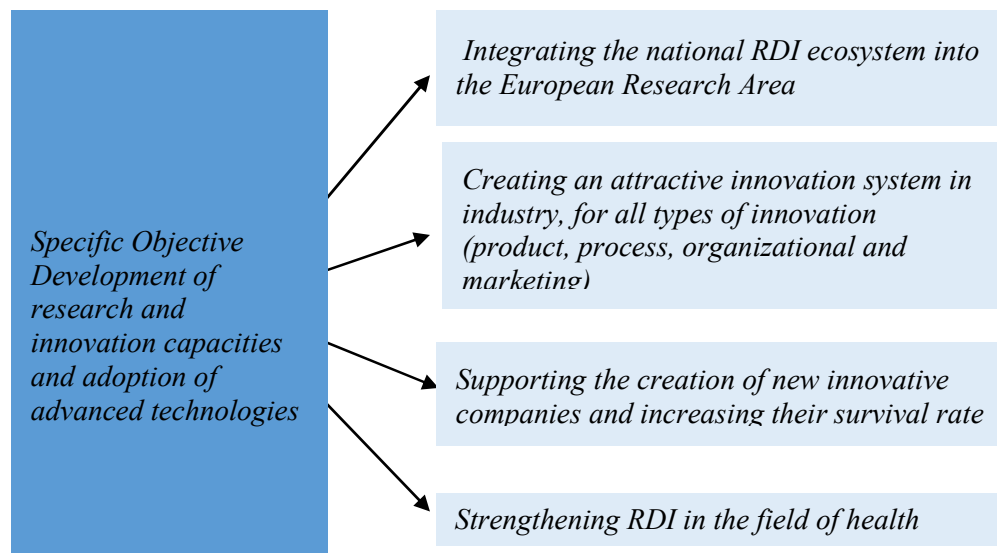
OG 2. COMPETITIVENESS



To achieve the general objective 2. **COMPETITIVENESS** and the specific one: Promoting the growth and competitiveness of SMEs, the following measures and sub-measures have been proposed:

- Regarding the measure: *Facilitating access to finance for SMEs, including by encouraging the initial and early financing of start-ups with high innovative potential* was established as a sub-measure:
 - Provision of Financial Instruments for SMEs - national interventions
- Regarding the measure: *Consolidation of the competitiveness of the Romanian economy* were established as sub-measures:
 - Facilitating investments in new technologies - regional interventions
 - Support for internationalization - regional interventions
 - Supporting the adoption of IT&C technologies by SMEs - regional interventions
 - Supporting clusters for their integration into European value chains - regional interventions
 - Supporting the implementation of the mechanisms of the circular economy within the Romanian enterprises - regional interventions
- Regarding the measure: *Supporting the creation of new companies and increasing their survival rate* was established as a sub-measure:
 - Support for the creation of new enterprises (start-ups, scale-ups) - regional interventions

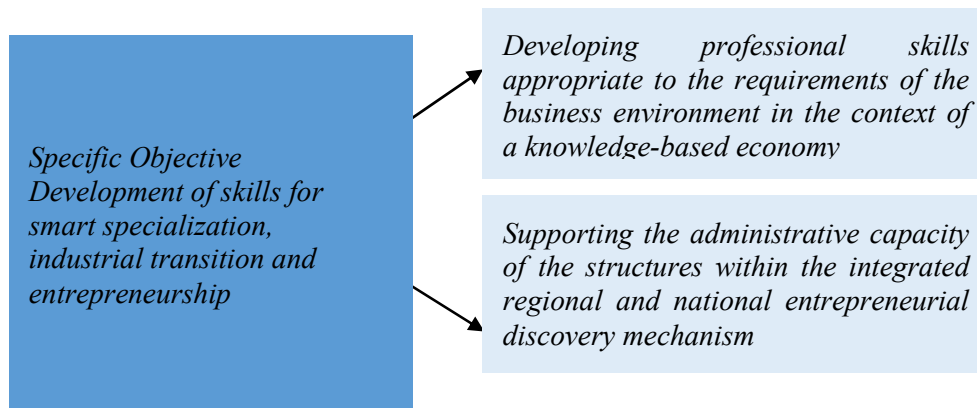
OG 3. RESEARCH AND INNOVATION



In order to meet the general objective in the field of research and innovation and the specific objective on: Development of research and innovation capacities and adoption of advanced technologies, the following measures and sub-measures have been proposed:

- Regarding the measure: Integration of the national RDI ecosystem in the European Research Area (European Research Area) were established as sub-measures:
 - Integration of Romanian RDI organizations in cross-border and international collaboration programs (Horizon Europe Synergies, Single Market, Interreg, etc.) - national / regional interventions
 - Development and use of RDI infrastructure - national / regional interventions
- Regarding the measure: Creating an attractive system of innovation in industry, for all types of innovation (product, process, organizational and marketing) were established as sub-measures:
 - Strengthening the RDI capacity of enterprises and promoting collaboration between RDI organizations and the business environment - national / regional interventions;
 - Supporting technology transfer processes to increase the degree of innovation of enterprises - national interventions;
- Regarding the measure: Supporting the creation of new innovative companies and increasing their survival rate were established as sub-measures:
 - Development of an entrepreneurial ecosystem that favors the emergence and maturation of innovative start-ups / spin-offs - regional interventions;
 - Development of services related to business support infrastructures (incubators, accelerators, etc.) - regional interventions;
- Regarding the measure: Strengthening RDI in the field of health was established as a sub-measure:
 - Development of research / innovation capacity and adoption of SMART systems in health - national interventions.

OG 4. SMART SPECIALIZATION, INDUSTRIAL TRANSITION AND ENTREPRENEURSHIP



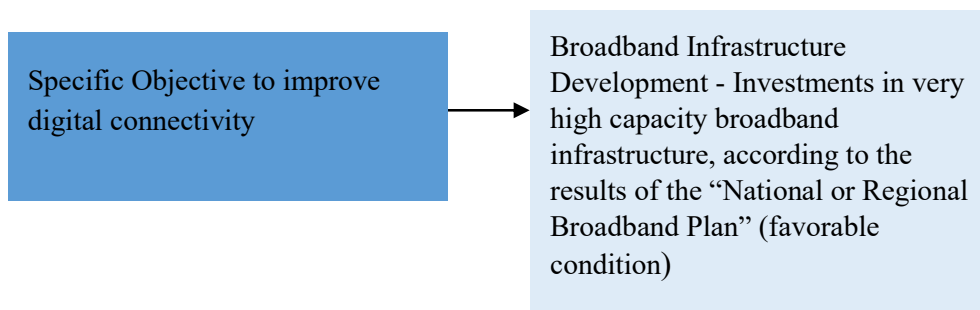
In order to achieve the general objective of smart specialization, industrial transition and entrepreneurship, it was established as a specific objective: Development of skills for smart specialization, industrial transition and entrepreneurship being proposed to implement the following measures and sub-measures to achieve the objectives:

- Regarding the measure: The development of professional skills appropriate to the requirements of the business environment in the context of a knowledge-based economy were established as sub-measures:
 - Development of competencies at the level of RDI enterprises / organizations / entities (regional interventions) through:
 - involvement in the Entrepreneurial Discovery Mechanism for intelligent specialization, industrial transition and entrepreneurship, including internships;
 - endowment of high schools for the application of digital learning methods
 - Training for the implementation of the standard: Innovation Management system in companies

- Regarding the measure: Supporting the administrative capacity of the structures within the integrated regional and national entrepreneurial discovery mechanism were established as sub-measures:
 - Developing the administrative capacity of the actors involved in the implementation, monitoring, review of smart specialization strategies and the Entrepreneurial Discovery Mechanism (MDA) (national and regional interventions) by:
 - administrative capacity of the actors involved in MDA (as it results from the Methodology for carrying out the entrepreneurial discovery process;
 - administrative capacity of ADRs;
 - ADR capacity to support beneficiaries.

For priority objective 2 A more connected Romania was proposed:

OP 2. BROADBAND



For priority objective 3 A more social Romania were proposed:

In the field of EDUCATION

- Improving the quality, effectiveness and relevance of the education and training system for the labor market, to support the acquisition of key skills, including digital skills, by implementing the following measures:
 - Adapting education and training programs to market requirements, in key and digital skills
 - Increasing the quality, effectiveness and relevance of education provision and services (at all levels)
 - Correlation between the needs of pupils and students, counseling services, support, accompaniment
 - Improving teacher training to increase the quality and effectiveness of the educational process

In the field of SOCIAL INCLUSION

- Promoting the socio-economic integration of third-country nationals and marginalized communities, such as the Roma
- Improving equal and timely access to quality, sustainable and accessible services; modernizing social protection systems, including promoting access to social protection; improving the accessibility, effectiveness and resilience of healthcare systems and long-term care services

In the field of HEALTH

- Improving equal and timely access to quality, sustainable and accessible services; modernizing social protection systems, including promoting access to social protection; improving the accessibility, effectiveness and resilience of healthcare systems and long-term care services

In the field of EMPLOYMENT

- Improving access to the labor market for all jobseekers, especially young people, the long-term unemployed and disadvantaged groups in the labor market, inactive people, by promoting self-employment and the social economy by:
- Development of the mechanism for multidisciplinary integration of employment, education, social assistance and health policies by harmonizing the legal framework between the services offered to the labor force by the four sectors
- New approaches to providing integrated employment services, adapted to the needs of disadvantaged groups on the labor market (inactive people, with disabilities, long-term unemployed, returnees, migrants, etc.), through personalized and tailored service packages
- Promoting entrepreneurship, supporting entrepreneurial initiatives

For priority objective 4 A greener Romania, the following interventions have been proposed:

In the field of Energy:

- Promoting energy efficiency and reducing greenhouse gas emissions,
- Promoting energy from renewable sources,
- Development of intelligent energy systems, networks and storage outside TEN-E.

In the field of Climate change, risks, water:

- Promoting adaptation to climate change, risk prevention and disaster resilience,
- Promoting sustainable water management,

In the field of Circular Economy:

- Promoting the transition to a circular economy
In domeniul Biodiversitate, Aer și Situri contaminate:
- Improving the protection of nature and biodiversity, green infrastructure, especially in urban areas, and reducing pollution,

For priority objective 5 The following interventions have been proposed for a Romania closer to its citizens:

In the field of Urban Mobility

- Sustainable, smart and intermodal climate, resilient, sustainable and intermodal national, regional and local mobility, including improved access to TEN-T and cross-border mobility

2. Literature Review

It is already scientifically proven that digital technologies are changing the way society works.

The changes are obvious no matter how fast we accept them. Romania is in competition with other countries in the world to occupy an important strategic place among those who impose life changes on Earth.

Digitization has penetrated strongly into the structures of public and private institutions of the great planetary economic powers (USA, Japan, China, Germany, France, UK, and Singapore).

There are trained people, education and local private companies in Romania that can place Romania among the great winners of the new industrial revolution 4.0, of digitalization. [1]

The evolution of the paradigm of the production process - the industrial revolutions 1-4

Since the first industrial revolution (mechanical warfare with water and steam as energy) the trend has been to release the human element from the production cycle to increase productivity, quality and uniformity of products.

The second industrial revolution (assembly line and electricity) further mechanizes the realization of complex products composed of several components made separately and is a significant step in efficiency, uniformity and productivity (Ford model T product example).

The third industrial revolution, generated by the introduction of the programmable automaton (PLC), brings cybernetics and electronics to the production line.

The fourth industrial revolution aims to integrate physical and cybernetic systems into a unitary, digitized whole.

Each industrial revolution represents a leap in productivity based on previous developments, but also by introducing a new paradigm of industrial activity.

What's behind the "buzzwords" of I4.0 and IoT? [4]

Current technologies under the I4.0 umbrella (IoT, Industrial Ethernet, Cloud, Big Data, Edge Computing, Fogetc.) Are not just marketing “packaging”, but represent the technological answer to concrete needs in digitizing the industrial production environment to increase performance, operational and agility to adapt to change. Industry 4.0, Smart Factory, Industrial Internet, The Connected Machine-terms that cover the same concept. IoT key component.

Behind the generic names are technologies and services that ensure superior competitiveness through the digital integration of processes, equipment, materials and products. From smart materials to smart products through a chain of logistics, production, maintenance, digitally integrated.

What does I4.0 mean? [5]

- Integration of cybernetic and physical systems in a single digital universe for control and interconnection of production processes. Interconnection of the service chain through IT platforms.
- It means a mix of technologies, processes, services whose role is to create a unique digital space for industry.
- It means the unification of digital technologies with those of production and the integration of management platforms.
- Brings efficiency (use of materials, energy), agility (market adaptation, technologies, new products), cost reduction, quality, productivity.

3. Proposed measures to be implemented:

By implementing at national level an integrated mechanism of intelligent specialization to facilitate the transition to the new standards imposed by the European Union, Romania should propose and implement concrete measures such as:

- Starting a research program applied on RI 4.0 as a national strategy,
- Building a system of relations through which Romania can influence the development of RI 4.0 in other countries for a mutual benefit,
- Rapid development of pilot solutions in education, health and administration,
- Reopening of high schools, industrial colleges for the training of specialists, operators in RI 4.0 and robotics.

4. Conclusion

We have been witnessing for several years, in the world, the phenomenon of Industry 4.0, the fourth industrial revolution, which involves changing the current industrial paradigm: the transition from computerization and automation to the involvement of Cyber-Physical-System (CPS), Internet of Things and Internet of Things in processes technological and decision-making.

Industry 4.0 or the "Fourth Industrial Revolution" is a transformation characterized by the computerization of industrial processes, which leads to the creation of a fusion between the physical and digital world. Industry 4.0 involves a partial transfer of decision-making autonomy and cyber coats of arms.

The initial objectives of Industry 4.0 were to automate and optimize production. Currently, following the achievement of the first set objectives, Industry 4.0 focuses its efforts on innovation and the creation of new business models.

Every company constantly needs up-to-date information in order to be able to carry out its activity successfully and to be able to respond to customer needs.

Industry 4.0 brings with it a number of innovations, which is why it is necessary for these companies to keep up with all the transformations that occur.

In this sense, we can propose 5 directions of intervention that companies could use as strategic directions that they can use as a strategic basis for digitization, respectively:

- Cost efficiency
- Development of digital platforms,
- Digitized distribution channels - by using digitization to create new digital distribution channels to customers and provide the opportunity to track the distribution process
- Product customization - by using digitization to create products tailored to customer requirements and needs,
- Development of digitized products and services - by creating new products that incorporate digital features.

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