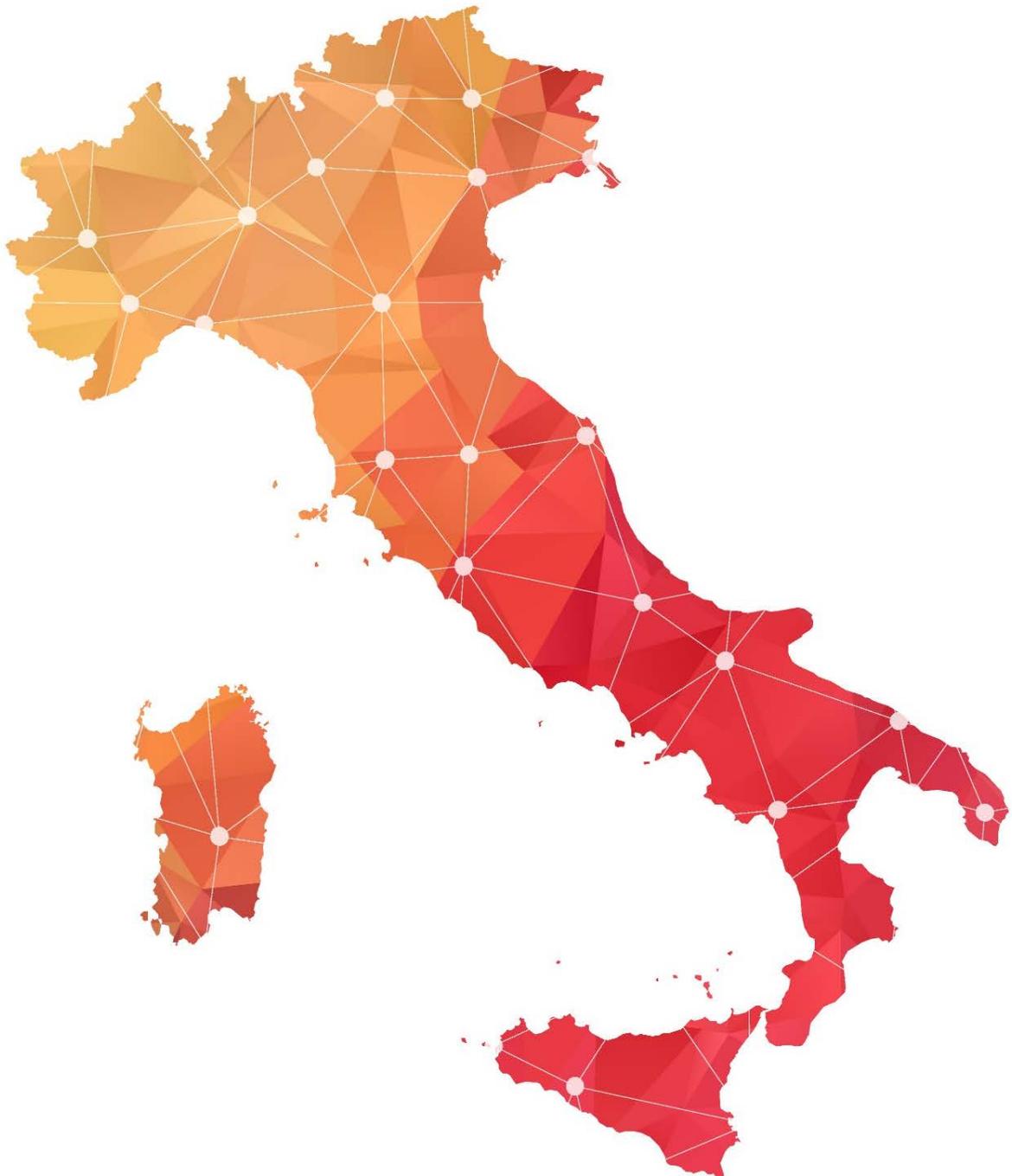


Country Study: Italy

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Introduction

Today Italy lacks a national industrial innovation agency. The country has not been equipped with an innovation and industrial strategy since the 1990s, a period which can be seen as a turning point in Italian political economy. In short: at that time industrial policies faded away in favour of competition policies, privatisations, and dismantling of public institutions aimed at guiding industrial and innovation development (Viesti 2013; Lucchese et al., 2016; Cresti et al., 2020). Besides, severe structural changes affected the Italian economy with deindustrialization and offshoring processes – accelerated by the 2008 crisis first and the subsequent pandemic weakening the industrial base and the sectoral innovation performance (Accetturo et al., 2013; Arrighetti and Ninni, 2014; Di Bernardino and Onesti, 2021).

In 2016, a new national strategy - 'Industry 4.0' (reframed 'Transition 4.0' in the 2021 National Recovery Plan) - was put forward for the technological upgrading of the productive structure. However, that strategy consisted of a series of so-called *horizontal* measures, such as fiscal incentives, without targeting strategic industrial productions, but rather providing a list of key 'enabling technologies that should be adopted by "generic firms", most of them belonging to the branch of the services, following a *technology-neutral* approach. This strategy has been pursued by the Ministry of Economic Development, without establishing an Agency with the specific objective of guiding technological transitions and thus lacking a clear direction of development. Among the few national initiatives, there is "Invitalia" - a national public agency for the attraction of investments and firm development - and "Agenzia per l'Italia digitale", a kind of national innovation agency established in 2012, which is mainly focused on the digitalization of the Civil Service rather than on industrial policy. Besides these initiatives, the Competence Centres established under the Industry 4.0 programme should be mentioned too (Prodi et al. 2021). They are public-private partnerships in charge of carrying out activities of orienteering and training for firms on 4.0 issues, and of supporting the implementation of innovation projects and R&D activities targeting 4.0 technologies.

There are eight such Competence Centres in Italy (listed here:

<https://www.mise.gov.it/index.php/it/incentivi/impresa/centri-di-competenza>). Together with these Competence Centres, the Ministry for Economic Development recently certified a series of national agencies (e.g. Digital Innovation Hubs, Centres for Technological Transfer, etc.) that support technology transfer and the digital transformation of firms. They have been gathered in the platform Atlante i4.0 (<https://www.atlantei40.it>).

Emilia-Romagna has an important manufacturing structure and has also seen in recent decades significant employment growth in tertiary activities. This *manufacturing-tertiary structure* has shown no signs of slowing down even during the most critical years of the international economic crisis. Specifically, in the last decade, the manufacturing sector witnessed an increase in the relative weight of the agri-food industry, the chemical and pharmaceutical sector, machinery and equipment, and high-tech manufacturing. On the contrary, a relative decline took place in textiles and clothing, wood, paper and printing, and the non-metallic mineral processing sector, which includes the ceramic sector (ART-ER 2020).

In Emilia-Romagna, manufacturing is a central driving force of regional growth, not only in terms of employment share, but also as an engine of foreign trade, a stimulus of new knowledge and innovations, and higher productivity (Antonietti et al. 2022). It is also important to note that Emilia-Romagna is home to predominantly small and micro enterprises: in fact, SMEs in the manufacturing and services sector with less than 50 employees employ 61.3% of the total workforce, although it should be noted that industry in the strict

sense has a much larger average enterprise size. There is of course a sectoral effect on enterprise size, since, in terms of employees the highest values concern enterprises in the machinery and equipment sector, the food industry, ceramics and transport equipment; micro-enterprises (<10) represent the largest component in all manufacturing sectors, with the highest absolute values in Metallurgy and metal products, Textiles and clothing and Food industry, while the and small and medium enterprises (<50 employees) record high values in metallurgy and metal products, Wood, paper and printing, textiles and chemicals and pharmaceuticals, and Electronics and electrical equipment (ART-ER 2020). As already noted, these data should be seen within a long-term horizon that has seen, on the one hand, a relative decline of manufacturing with a shift in terms of employees towards tertiary activities, as well as a progressive servitization of manufacturing processes.

On the other hand, the economic crisis of 2011 triggered a severe selection among companies that contributed to widening not only the size gap but also the technological gap between companies. This process has been significant, especially within industrial districts, which constitute a distinctive feature of the Emilia-Romagna production and industrial system allowing the accumulation of high and specialised professional skills and technical knowledge over time (Brusco 1982). The transformations underway could therefore expose the territory to the risk of erosion of the accumulated stock of knowledge and skills that characterize production activities in Emilia-Romagna and other areas of North-East Italy.

On the demographic and social side, the composition of the population of the Emilia-Romagna region has also undergone important changes. The main phenomena are the progressive ageing of the population and labour force, the increase in the diversity of the composition of the social body due to the massive flows of migrants, both from abroad and from other Italian regions, and the greater mobility of people. In this context, the dynamics of per capita GDP have been largely influenced by regional population growth.

Already in the first part of the 2000s, output per capita in Emilia-Romagna grew less than in the rest of Europe. This lag was only partly due to the dynamics of productivity (GDP per person employed), which moved substantially in line with the other EU regions, while it was made worse by a lower increase in the employment rate and labour market participation. In fact, in Emilia-Romagna, the higher productivity growth was offset by the lower employment intensity of growth (compared to Italy). Unemployment in Emilia-Romagna is mainly attributable to an increase in active population at a rate higher than that of job creation: in the decade between 2008 and 2019, the active population in Emilia-Romagna grew at a more intense rate than the number of employed people (+6.9% as opposed to +4.3%), which had a significant effect on unemployment (ART-ER 2020; Arrighetti et al. 2021).

It is precisely in the face of these challenges, which have intensified over the last few years, that the Emilia-Romagna regional government promoted *The Pact for Work*, drawn up in 2015 and subsequently updated, in December 2020, in *The Pact for Work and Climate*. Both Pacts were proposed as a project shared by more than 50 signatories, both public and private, for the relaunch and development of the Emilia-Romagna region through the generation of quality jobs.

The four challenges that the two Pacts identified as crucial are:

- demographic crisis,
- digital transformation,
- the fight against inequalities,
- climate change emergency.

In particular, the signatories of the Labour Pact have set themselves a goal consistent with the potential, specialisations and excellences that the territory already expresses, i.e. "to make Emilia-Romagna a European research hub and to become the cutting edge of a new manufacturing, connected to new services, able to combine environmental sustainability and knowledge production and to combine cultural and creative competences with technological competences, to transform contents into high added value products" (ART-ER 2020, p.34). The two 'Pacts' represent a new generation of public policies based on systematic interaction between various levels of governance, on strategic coordination of regional actions, on the integration of regional, national, and European funds and on the ability to combine the support of manufacturing excellence with attention to diversity and fragility in the regional territory. Alongside these 'Pacts', other policy documents have been produced whose aim is to identify the trajectory of the structural transformations that should take place in the Emilia-Romagna territory, such as the Digital Agenda of Emilia-Romagna (2015-2019) and the Regional Strategy Agenda 2030 for Sustainable Development.

In this framework, the role of ART-ER has been central over the past few years since it operated in the direction of orienting the innovation activities of actors and stakeholders of the regional innovation ecosystem towards the objectives set by the 'Pacts' and other strategic documents (see Section 3). ART-ER (which, before 2019, operated in the form of the two separate agencies ASTER and ERVET) encouraged and promoted a series of initiatives in several areas considered strategic by the Region, thus making itself not only one of the main implementers of these initiatives but also acting as a promoter and guide for sustainable structural change in the Region.

Organisations

ARTER, the Emilia-Romagna Region innovation agency

ART-ER was created in 2019 from the merger of the 'in-house' company ERVET (*Emilia-Romagna Valorizzazione Economica Territorio*) and ASTER (the Emilia-Romagna consortium company for innovation and technology transfer at the service of enterprises, universities, and territory), both of which had been in existence since the early 1990s. This was the result of a merging process that started in the last months of 2017. The process of reorganising and rationalising ASTER and ERVET into a single company was aimed at setting up an agency specialised in supporting regional policies on regional planning and economic development, research, and the environment.

In this perspective, territory, innovation, internationalisation, and attractiveness have become the main areas of intervention by ART-ER, to promote and support the Region in the sustainable governance of the structural transformation taking place within the regional innovation ecosystem. This involved institutions, training and research systems, the production system, intermediate bodies representing socioeconomic interests, and the whole of civil society.

The activity of ART-ER in recent years, and previously that of ASTER and ERVET, fostered coordination and enhancement of the Emilia-Romagna innovation ecosystem according to a model of open and sustainable innovation, in which enterprises, start-ups, research centres, civil society, and civil associations interact and share experiences and initiatives, access the same pool of resources, and can cross-fertilize their activities. On the other hand, the merger of ERVET and ASTER into a single company finds its *raison d'être* in the desire to enhance, and make more efficient, effective, and transparent the management and promotion of this ecosystem, which over the years has become increasingly participatory, complex, and exposed to challenges that require the search for shared solutions.

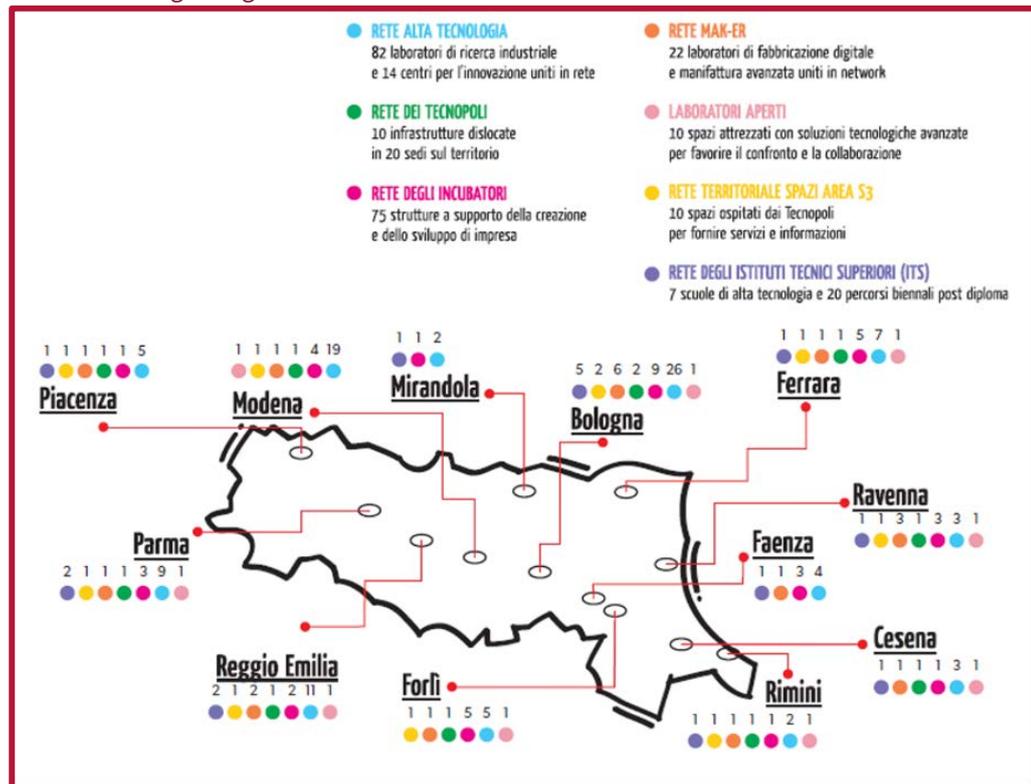
The Emilia-Romagna regional innovation ecosystem is the result of more than ten years of interventions aimed at promoting the creation of collective knowledge-intensive innovation and learning processes. Within that ecosystem, interactions and knowledge circulation between its various actors (enterprises, universities, research centres, laboratories, etc.) occur widely and frequently: in fact, these interactions are facilitated by the very measures and tools that have been put in place over the decades to detect *latent innovation needs* and direct them towards *more coherent solutions*, of making the ecosystem *easily accessible* and open also from the outside, and of *raising the level of attractiveness* of the whole territory.

The ecosystem is mainly made up of physical 'places' and 'communities' and is organised in collaborative networks characterised by a variable geometry that works under ART-ER's coordinating actions in fields of interest considered priorities for regional development. Specifically, the industrial innovation ecosystem rests on a regional *High Technology Network*, which connects 82 mixed laboratories and 14 Innovation Centres.

Recently, the Network has undergone a process of reorganisation according to a territorial criterion linked to the regional Smart Specialization Strategy (S3), which has led to the creation of ten *Technopoles* (Figure 1). This was done to foster awareness, visibility, and coherence of interventions, and of promoting local innovation ecosystems in collaboration with territorial actors. The Technopoles are distributed throughout the Emilia-Romagna region and host service facilities for dissemination, demonstration, information activities, reception facilities for companies, spaces for innovative spin-offs, and private research laboratories. Within the Technopoles there are the Area S3 Spaces, whose task is to foster the coming together of entrepreneurs, start-

uppers, and researchers to generate new projects and opportunities for innovation-related career paths. Business incubators and 'greenhouses', on the other hand, offer services for growth, intercepting business opportunities, and financing. In 2017 ART-ER completed the setting up of the Clust-ER thematic associations, which are focused on the specialisation areas of the regional Smart Specialization Strategy S3 and are made up of laboratories and innovation centres of the High Technology Network, companies, and higher education institutions. The Clust-ERs aim to develop strategic projects in the field of collaborative research.

Figure 1: The Emilia Romagna High-Tech Network¹



Other initiatives include FabLabs, the ITS (Istituti Tecnici Superiori) network, the MUNER association (a result of collaboration between regional universities and car manufacturers such as Ferrari, Lamborghini, and Maserati), the Mak-ER network (gathering 14 laboratories on digital manufacturing), and the Big Data association. In terms of digital innovation, a key role within the ecosystem is played by the Digital Enterprise Points (located at the Chambers of Commerce) and the Digital Innovation Hubs, which are the gateways for companies to access Industry 4.0 services. These are complemented by the BI-REX Competence Centre, which assists companies in digitising their products or industrial processes. Lastly, all these 'places' and 'communities' have recently been joined by 'EROI - Emilia-Romagna Open Innovation', which aims to offer an additional space to connect and network the players of the ecosystem on digital issues. The changing context in which ART-ER found itself operating already in the period preceding the outbreak of the pandemic required the agency's mission to take an increasingly multidimensional character to support the strategic planning of the Emilia-Romagna Region.

On the one hand, the Region redefined its operational programming, also regarding the European development funds for the 2021-2027 seven-year period. In this connection, ART-ER gradually strengthened its role as a promoter and implementer of regional programming. In fact, ART-ER not only acts in continuity with the

¹ Source: ART-ER (2020)

activities of its pre-merger parent companies (ASTER and ERVET). It also supports the Region in driving structural change processes towards economic and production models centred on environmental awareness, sustainable use of resources and energy, as well as better jobs for a better quality of life. (Green economy, blue economy, circular economy, and urban regeneration).

Internal structure and governance

Following the merger between ASTER and ERVET, the internal organisation of ART-ER underwent changes and reconfigurations, which are still ongoing at present, and are affecting the governance architecture of the new agency. The main unit responsible for the governance of ART-ER is the Board of Directors. The Board of Directors of ART-ER has the task of bringing the merger to a successful conclusion, proceeding to the integration and reorganisation of its internal structure, the harmonization of the 'epistemic cultures' of ASTER and ERVET, the integration of their external relations, and a new definition of the relationship with its "principal" (i.e., the Emilia-Romagna Region and associated bodies). Following the merger between the two companies in May 2019, the internal organisation of ART-ER, which is a consortium company, underwent changes and reconfigurations, which are still ongoing at present, and which also affected the governance architecture of the new agency (Figure 2).

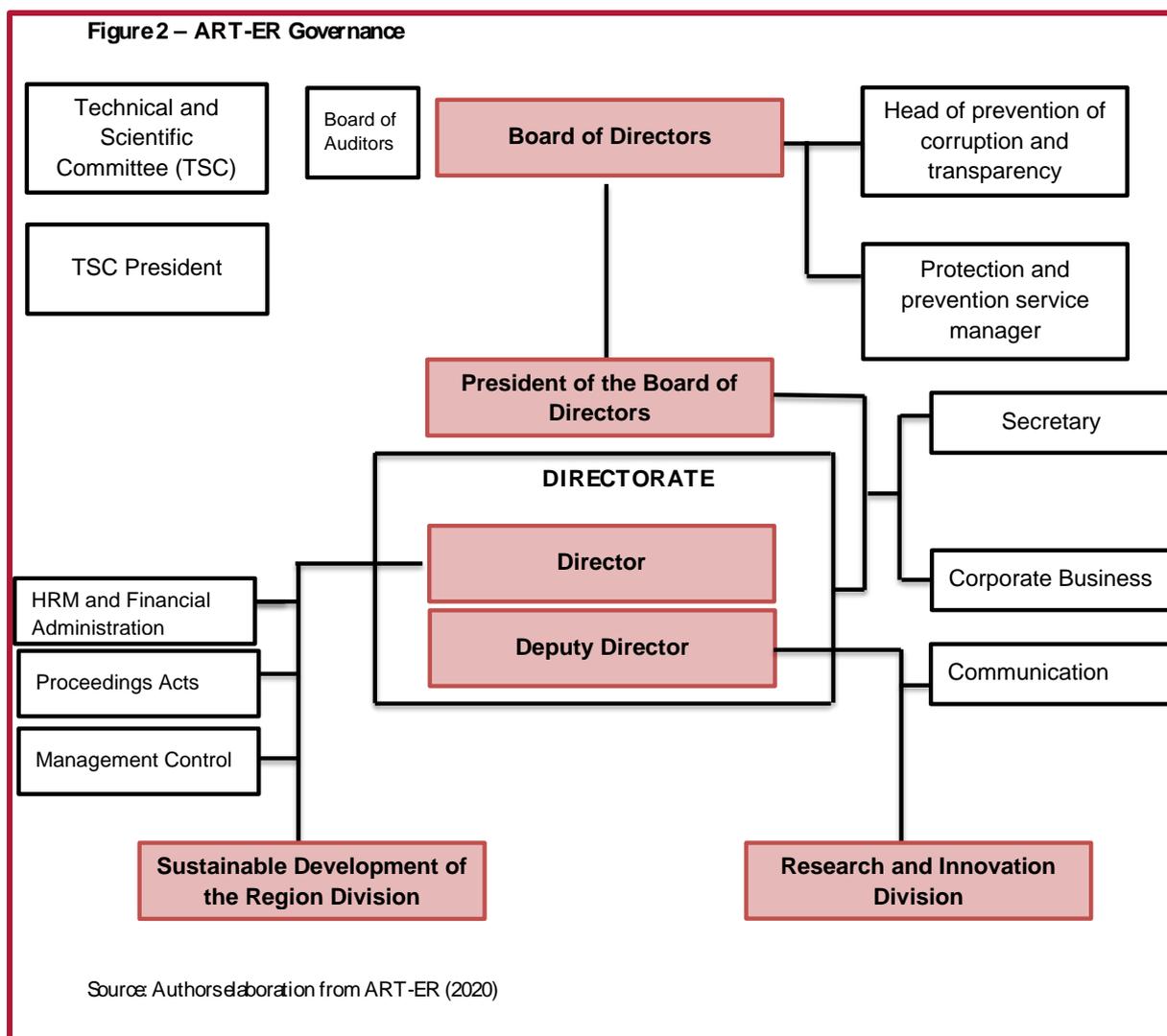
The unit responsible for the governance of ART-ER is the *Board of Directors* (CdA).

ARTER's Board of Directors has the task of bringing the merger process to a successful conclusion, through integration and reorganisation of its internal structure, harmonization of the parent company's cultures, developing external relations and redesigning the relationship with its "principal" (the Regional government and associated bodies).

The Board of Directors is supported by a Technical-Scientific Committee (TSC). This is a newly established entity, whose emergence followed the merger of the two previous agencies, and which therefore plays an unprecedented role compared to the organisational structures of the parent companies.

Specifically, the role of CTS is to contribute to identifying the medium and long-term strategies of ART-ER to strengthen connections between regional research, education, and production systems, as well as encourage integration with national, European, and global dynamics. The CTS is also tasked with monitoring, guiding, and assessing the activities of the High Technology Network.

To fulfil its tasks, the CTS produces a three-year Strategic Analysis and Planning Document, which is updated year after year. This strategic document is discussed with the Agency management and employees, with the institutional representatives of the Emilia-Romagna Region, and with the main stakeholders of the regional research, production, and innovation ecosystem.



The President appointed by the Emilia-Romagna Region for the three years 2019-2021 is Marco Di Tommaso, Professor at the University of Bologna, while the CTS members are: Emilia-Romagna Region, the University of Bologna, the University of Modena and Reggio Emilia, the University of Parma, the University of Ferrara, the Catholic University of Milan, the Polytechnic University of Milan, the National Research Council, ENEA, INFN, Unioncamere, CNA, Confindustria, Confcommercio, Confartigianato, Confcooperative, Confesercenti, Legacoop, ABI.

The *General Manager* of ART-ER is the former director of ERVET (Roberto Righetti) while the *Deputy General Manager* is the former Director of ASTER (Marina Silverii).

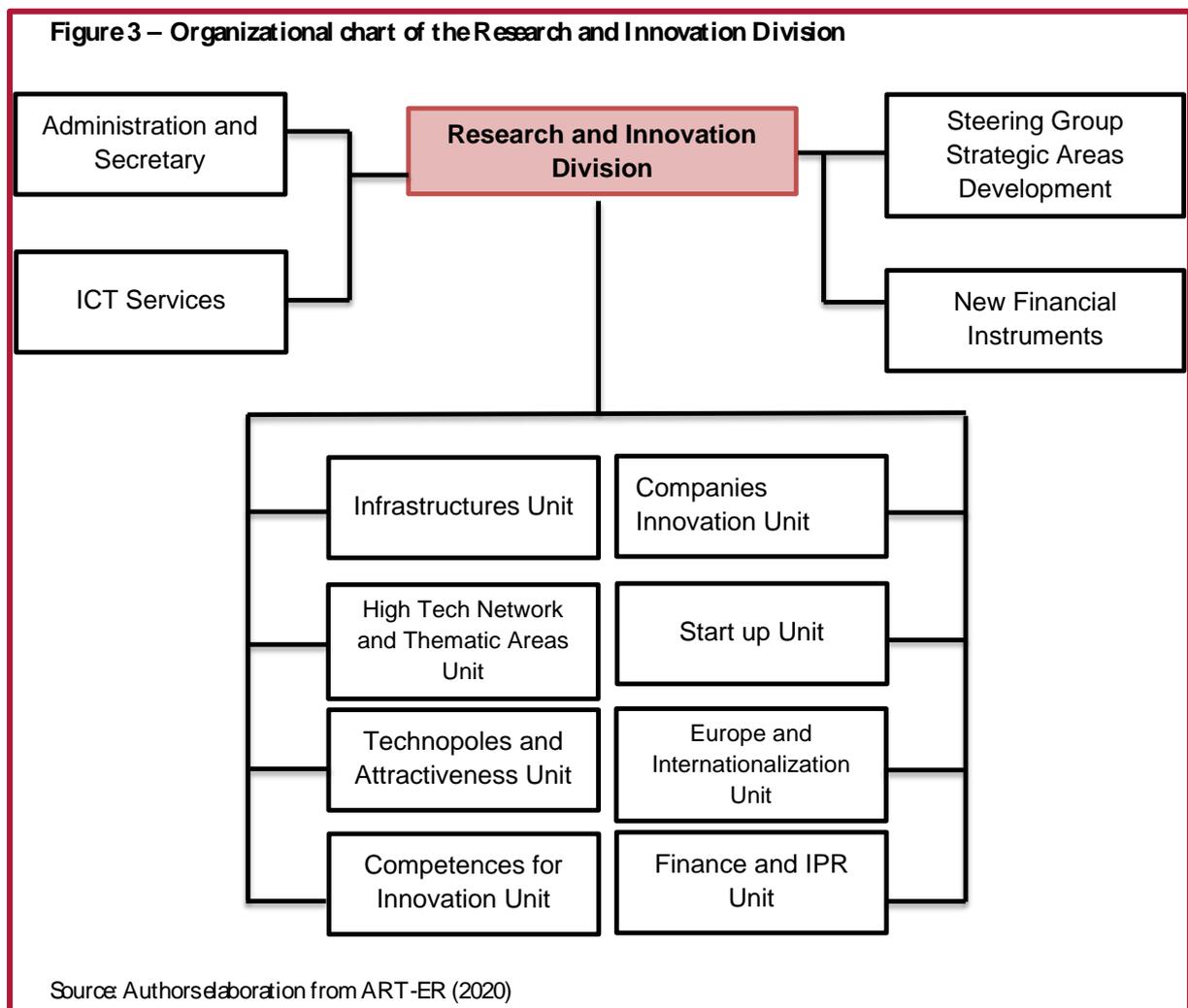
Lastly, there is a *Board of Auditors* appointed by the Regional Government (Chair: Pier Luigi Ungania). Two members of the Board of Auditors supervise compliance of ART-ER's initiatives with the Agency Statute, and the adequacy of ART-ER's organisational, administrative, and accounting arrangements. ART-ER is organised into two divisions, the *Sustainable Development of the Region Division* and the *Research and Innovation Division*, which correspond to ASTER and ERVET, respectively. As a result of the merger, ART-ER functions are now numerous and complex, and a harmonisation and coordination process of previous tasks is currently underway. For this reason, it is of interest to look at the internal structure of the two Divisions.

The *Research and Innovation Division* is entrusted with operationalising, developing, and monitoring the strategic areas and thematic priorities identified at the regional level, also through the development of new financial

instruments. The *Sustainable Development of the Region Division* is responsible for economic and statistical analyses addressing the multiple dimensions of the Region’s development. It is also tasked with monitoring the implementations of the projects promoted within its field of action and the planning of the regional Digital Agenda.

To fulfil their respective objectives, each Division is endowed with several operational units: the Research and Innovation Division is made up of eight operational units, while the Sustainable Development of the Region Division is made up of six operational units, flanked and assisted in their tasks by three departments known as 'special structures'. Given the composite organisation of both divisions, it is interesting to delve into the field of action that characterises the work of each unit and its special structure.

The Research and Innovation Division hosts 8 operating units covering the following areas: infrastructures, high-tech networks, and themes, technopoles and territorial attractiveness, innovation capabilities, business innovation, start-ups, Europe, and internationalisation, finance, and intellectual property rights (Figure 3) (ART-ER, 2020).



- a) **Infrastructures Unit:** this Unit deals with innovation infrastructures following two lines of action. On the one hand, the unit intervenes in the implementation of regional programs on network and digital economies, with specific reference to Big Data and Artificial Intelligence, channeling investments and strategic relationships to the territory. On the other hand, the unit monitors the projects for

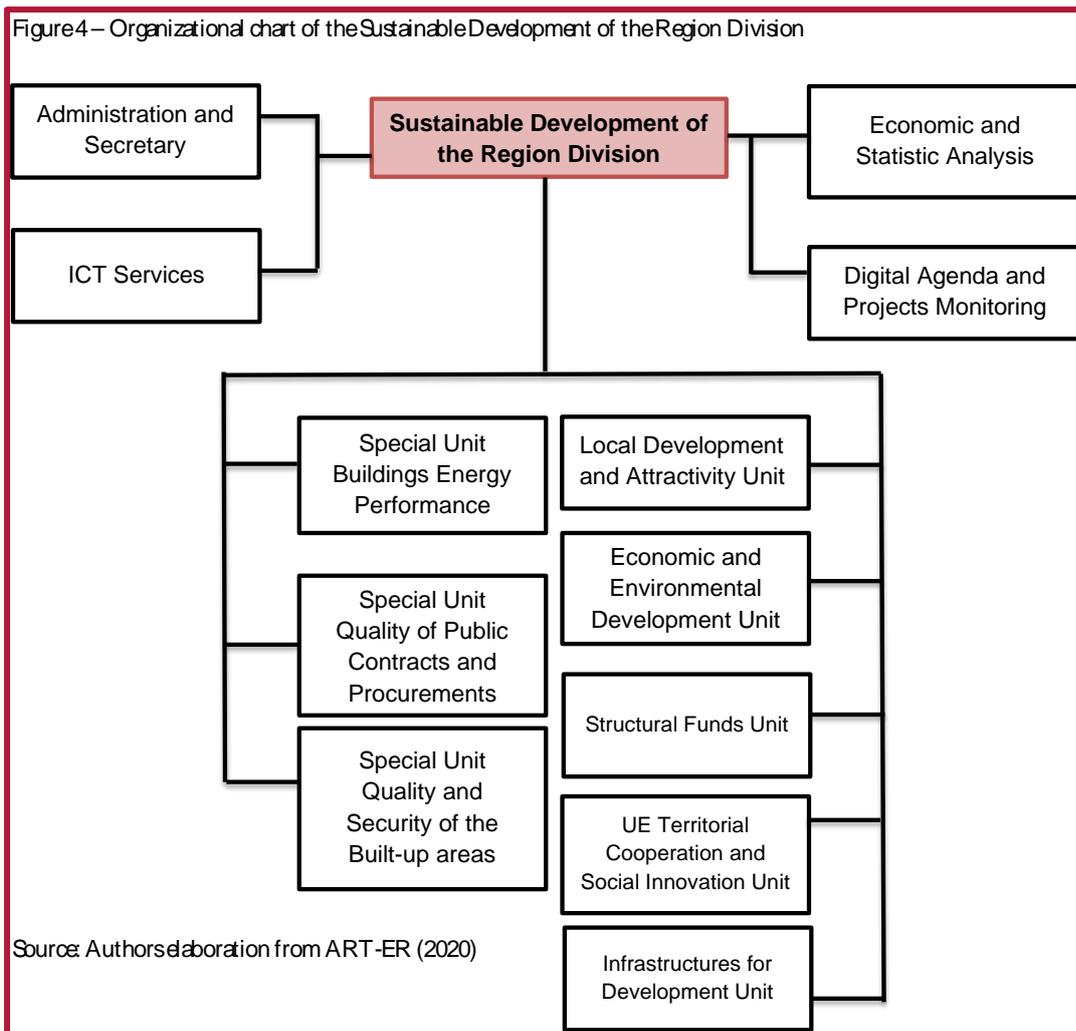
construction of the "Big Data Technopole," to be located at the former "Manifattura Tabacchi," which is to become one of the most important supercomputing infrastructures in Europe.

- b) **High-Technology Networks and Thematic Areas Unit:** The Unit oversees the coordination of the High-Technology Network and the Clusters-ERs. It also deals with the issues associated with the priorities defined in the S3 framework and the so-called transversal themes, including the circular economy, blue growth, climate change, urban regeneration, and digital economy. With specific reference to the implementation of S3, the unit provides technical assistance to the Region for the development of calls for research and innovation projects, for the accreditation of laboratories and centres of the High Technology Network, as well as for the maintenance of the S3 monitoring system.
- c) **Technopoles and Territorial Attractiveness Unit:** Thematically speaking, the unit intercepts several dimensions, related to the management of three networks, both infrastructural and project-related: the Technopoles Network, the territorial coordination tables, and the Mak-ER Network. The unit is also responsible for the management and implementation of digital infrastructures, including the Innodata online portal to allow widespread access to data on research and innovation, training, and other topics managed by the Unit. It also manages the Crowdfunding service to support innovative projects from start-ups, SMEs, research labs and public bodies with an impact on the regional territory.
- d) **Innovation Capabilities Unit:** This Unit is responsible for issues related to the attractiveness and development of young people's competencies related to innovation activities. To this end, the Unit also manages ten territorial spaces called AREA S3, which offer orientation services located at the Technopoles and the ART-ER Greenhouses. The unit also serves as a link between the regional research and innovation system, the education and training sector, and youth policies. Recently the Unit started to oversee social innovation activities, to reconcile industrial research strategies with new models of social progress within communities and territories in the Region.
- e) **Companies Innovation Unit:** The Unit's task is to engage with the enterprises of the regional production systems conveying information and providing guidance concerning regional innovation policies, actions, initiatives and services within the Smart Specialization Strategy. The unit promotes the visibility of the regional industrial research community; connecting enterprises, start-ups, research institutions, and public bodies within collaborative innovation projects, thus fostering mutual fertilization and networking both at local and international levels; it also provides technical assistance to enterprises on technological and managerial innovation needs.
- f) **Start-up Unit:** The Unit oversees connections between start-ups and large enterprises and entrepreneurial groups, playing an active role in creating opportunities for start-ups by providing information on innovation processes, welfare tools, emerging new markets, and technology trends. The unit relies on a wide range of programs and initiatives, including ART-ER Startup ER, Climate KIC accelerator, Emilia-Romagna Startup, IN-ER network, and Mentor Board. The unit also relies on a wide variety of relations not only with local stakeholders but also with international partners, for example by maintaining a constant dialogue with Silicon Valley actors.
- g) **Europe and Internationalization Unit:** The Unit support SMEs and big companies to access European programs and funds, and European networking initiatives, as well as to participate in European and international calls for tenders and events related to the thematic areas linked to the S3 priorities. The

unit is therefore responsible for managing a dense network of relations with companies, research units, regional and European institutions, and other stakeholders for supporting companies to establish contacts with potential new partners.

- h) **Innovation Finance and Intellectual Property Unit:** The Unit operates along two lines of intervention. The Innovation Finance area is concerned with guidance and information activities for companies to access capital, resources, and financial instruments for innovation, including facilities and incentives provided by the Region. Activities cover both start-ups and established companies in the area, which are also supported in managing relations with capital providers, banks, and financial market operators. The Intellectual Property area deals with guidance, information, and legal consultancy related to the protection of intellectual and industrial property rights. It also guides collaboration schemes between research and business.

The Sustainable Development of the Region Division hosts 8 operating units covering the following areas: territorial development and attractiveness; economic development and environment; structural funds; EU territorial cooperation and social innovation; infrastructures for development; digital agenda. The Units are supported in their work by three Special Structures, which are responsible for the accreditation and inspection activities, in compliance with the regulations in force (Figure 4)



Territorial Development and Attractiveness Unit: The Unit is responsible for the administration of territorial development, which has a transversal character in relation to sectoral policies. Under the multiple dimensions that concur to determine territorial development, the unit has accumulated over time important relations with local stakeholders, resulting from direct technical assistance provided across the territories, as well as from the management of public calls for tenders issued by the Region.

Economic Development and Environment Unit: The Unit deals with three main themes, i.e., environment, energy, and green economy. With reference to environmental issues, the unit is responsible for bringing to the region's attention operational ideas for policy planning, mostly related to green public procurement, sustainability instruments, climate change adaptation, and the use of EU structural funds. The unit's technical assistance also extends to the implementation and monitoring phases. Regarding the energy and green economy dimension, the unit provides technical support for calls for tenders, including international ones, develops and monitors the Regional Energy Plan, and manages the GreenER Observatory on the Region's green activities, collecting useful data for policy planning. Finally, competitive and trade dynamics in the context of digital transformation are also central to the activities and technical analyses conducted by the unit.

Structural Funds Unit: The Unit oversees technical assistance in the programming and managing of two of the main European Structural and Investment Funds, namely the Social European Fund and the European Regional Development Fund. The unit also provides the Region with specialized legal support in the field of State aid. A specific sub-unit supports the Structural Funds Unit with compliance aspects related to the implementation of interventions and eligibility of expenditure.

Infrastructures for Development Unit: The Unit has consolidated technical expertise in the field of construction, building, and engineering, which it uses in feasibility studies, complex programming, and project coordination.

European Union Territorial Cooperation and Social Innovation Unit: The Unit is divided into three major areas, i.e., European Union and Territorial Cooperation, International Cooperation, and Social Innovation. The European Union and Territorial Cooperation area covers analysis, monitoring, information, and training on European Union policies and programs, and welfare issues. The International Cooperation area covers cooperation with third countries at the EU level, internationalization of regional territories, management of bilateral and multilateral programs with European and non-European countries, and also planning and management of relations with cooperation agencies, international organizations and the third sector. Finally, the Social Innovation area deals with European, national, and regional instruments, regulatory institutions, organizations and stakeholders in the field of social economy and welfare.

Digital Agenda and Projects Monitoring Unit: This Unit is a new development. It works as a cross-units entity. The Unit combines issues related to the Digital Agenda, the development of digital skills, the design of innovative educational paths with a focus on digitalization, and the full use of digital citizenship rights, as well as the activities conducted by the Public Administration.

Three special structures (“Special Units”) provide support to the above-mentioned Units:

Buildings Energy Performance Special Unit: this Special Unit is responsible for administrative functions related to the management of compulsory procedural systems in the field of the energy performance of buildings, e.g., the energy certification of buildings and the control of thermal systems.

Quality of Public Contracts and Procurement Special Unit: this Special Unit intervenes in safeguarding and improving the quality of administrative procedures, in particular investments, procurements, and public contracting, to ensure compliance with the following principles: transparency, legality, competition, anti-corruption, the balance between quality of the service provided and cost of service, safeguarding the environment.

Quality and Security of Built-up Areas Special Unit: This Special Unit provides information databases and technical assistance on the safety issues related to construction sites, earthquake and disaster management, construction, and housing policies.

Processes

As commented in the previous section, ART-ER is at the centre of the regional innovation ecosystem and acts to make it grow and become more attractive by focusing on research, infrastructures, and capabilities as drivers of economic and sustainable development in the region.

ART-ER is tasked with:

- Coordinating and developing existing capabilities
- Facilitating dialogue between public and private players.
- Supporting start-ups and innovative enterprises.
- Participating in national, European, and international networks.
- Elaborating research on the territorial, economic and social assets of the territory.

In the following sections, we illustrate a few initiatives undertaken and coordinated by ART-ER. We particularly refer to the initiative "SERRE", related to the support of start-ups and innovative enterprises and to the Association CLUST-ER, tasked with facilitating the dialogue between public and private players.

Supporting start-ups and innovative enterprises: The “Serre” initiative (the “Greenhouse”)

The "Serre" of ART-ER are physical spaces dedicated to start-ups in Bologna. The initiative started in 2016 supported by a regional co-funding and it is managed by ART-ER in collaboration with the Municipality of Bologna. The "Serre" offer two lines of intervention dedicated to start-ups, namely:

1) Spaces and services for business development

Within this line, innovative start-ups with legal and/or operational headquarters in Emilia-Romagna can access the spaces “Le Serre di ART-ER” incubator and benefit from mentorship, training, and networking services.

Since 2017, “Le Serre di ART-ER” has offered acceleration services to start-ups, selected through a call for applications and hosted for a long period in the Bologna spaces. The service includes a dedicated office, tutorship, specialised advice, training, meetings with high-profile mentors and networking with useful contacts to boost their business. Since 2017, 23 start-ups have been hosted at “Serre di ART-ER”.

2) Pathways to accompany start-ups' growth

As of March 2021, "Le Serre di ART-ER" has renewed their portfolio of services, integrating previous services with a series of initiatives to accelerate start-ups' access and positioning in the marketplace. A choice that, despite a pandemic situation limiting in-person activities, strengthens the commitment of ART-ER and the Emilia-Romagna Region to supporting innovative enterprises.

To address the specific needs related to the different and multi-faceted development stages of a start-up, The “Serre” has launched an acceleration model that is flexible and characterised by customised pathways based on the integration of skills.

Such pathways primarily address:

- product/service development
- strategies for commercial growth, also on the foreign markets
- search for funding and investors

The manager of ART-ER Start-up Unit (see Figure 3 below) commented:

“The Analysis of the data collected by the Regional Observatory on Start-ups, coupled with our longstanding experience in business creation, suggests that the most difficult phase for new companies is the consolidation and growth, especially for innovative start-ups from the world of research. For this reason, we decided to design and implement general programmes dedicated to business creation, such as the Start Cup, along with tailored services to help new companies to grow, strengthen and consolidate their presence in national markets and internationalise. We have built tailored pathways based on companies’ needs by integrating different skills and services to intervene more effectively in that late stage”.

Additional services dedicated to the rise and growth of Green Tech companies have been put in place. Moreover, specific services for Cultural and Creative start-ups have been also created thanks to the experience gained by ART-ER through its involvement in European projects for the growth and development of companies in this sector.

Over the year 2021, 22 projects and start-ups benefited from the accompanying pathways. Moreover, the pathways are also the access point to all the partners of the Emilia-Romagna Start Up network. The Emilia Romagna Start-Up is another pivotal initiative activated by ART-ER to inspire start-ups and would-be entrepreneurs with innovative business ideas. It offers exclusive opportunities, such as an Info desk service, mentoring points across all the provinces of the region; constantly updated information on calls, incentives, and initiatives; a pool of experts on labour regulations, intellectual property protection, crowdfunding, tax, administrative and corporate issues, access to capital and finance. It also offers networking meetings, to match start-up representatives with established companies and managers in the AREA S3 spaces of ART-ER.

They are located within the Technopoles as spaces of aggregation between entrepreneurs, start-uppers, university professors, students, and researchers to generate new opportunities, especially for young people to access innovation-related career paths or to develop new projects. Within these Spaces, AREA S3 contact persons organise orientation and support meetings for entrepreneurship, workshops, networking events and activities in cooperation with local partners fostering innovation in the territory. There are 10 AREA S3 Spaces in Emilia-Romagna.

Facilitating dialogue between public and private actors: The Clust-ER Associations

Clust-ERs are virtual communities of public and private subjects (research centres, enterprises, training organisations) sharing ideas, skills, tools, and resources to support the competitiveness of the most relevant productive systems in Emilia-Romagna. A competitiveness that is no longer played on the ability of the individual actor (research centre or enterprise) to operate on the global market but that depends on the ability of the whole territorial system to be innovative and attractive.

Within Clust-ERs, the research laboratories and innovation centres belonging to the High-Technology Network interact with enterprises and higher education systems to create a critical interdisciplinary mass to multiply opportunities and develop strategic planning with a high regional impact.

Through the Clust-ERs, the regional industrial research and innovation system pursues greater integration and better positioning in the international sphere for:

- Maximising opportunities for participation in European programmes and international research and innovation networks.
- Achieving synergies and activating coordinated and stable networks and links with other public-private aggregations operating in the same fields at national and European levels.
- Encouraging and supporting the development and emergence of initiatives in the field of higher education and human resources development.
- Supporting and encouraging the development of new research infrastructures of general interest for the Emilia-Romagna region.

Clust-ERs are formal associations, established in compliance with Articles 14-42 of the Civil Code. The following entities can participate in the Clust-ERs:

- Industrial research laboratories and innovation centres accredited by the Emilia-Romagna Region.
- Enterprises, innovative start-ups.
- Consortium and business networks.
- ITS Foundations and training organizations accredited by the Emilia-Romagna Region and operating in higher education and technical training.
- Other organizations and institutions are active in the field of innovation.

To align their actions to the economic priorities defined set by the Region, every Clust-ER operates through working groups representing the most relevant value chains for the regional economy in terms of turnover, employment, and competitive positioning in the international context. To date, there are Clust-ERs:

- Agribusiness
- Building and Construction
- Sustainable Energy
- Health and wellness
- Culture and Creativity
- Mechatronics and motor engineering
- Innovation in services

For each value chain, a policy manifesto was drawn up to define its strategic vision and objectives, to strengthen the positioning of the value chain within the international competition. In June 2022, the Clust-ER Urban Economy has also born. Overall, joining a thematic Clust-ER means contributing to the strengthening of the regional research and innovation system by fostering more effective interaction between research laboratories, companies, and higher education systems through:

- The development of joint projects in the field of collaborative research.

- The implementation of systemic actions to promote projects targeting the sharing of resources and infrastructures, the development of joint labs, pilot plants and demonstrators between the research system and businesses.
- The promotion of joint actions for the exploitation of research results and knowledge transfer.
- The promotion of joint initiatives targeting higher education.
- The promotion of members' participation in national and international calls for proposals and funding programs.

Within Clust-ERs, laboratories and companies work together according to an open innovation model to identify opportunities for collaboration and exploitation of research results.

Content

As mentioned above, the main bodies of ART-ER are the Board of Directors, the Shareholders' Assembly (or Members' Assembly), and the Technical-Scientific Committee. The latter is appointed by the Members' Assembly and supports the Board of Directors in identifying medium- and long-term strategies aimed at strengthening regional excellence in research, education, and production activities, by also encouraging increasing integration of the Region in national, European and global dynamics.

Specifically, the Shareholders' Company (*Consortio*)n is composed as follows: Emilia-Romagna Region, which is also the majority shareholder (65 percent), University of Bologna (5.3 percent), National Research Council (4.5 percent), *Unioncamere* (Chambers of Commerce Union) (3.5 percent), University of Modena and Reggio Emilia (2.6 percent), University of Ferrara (2.6 percent), University of Parma (2.6 percent), University Cattolica-Sacro Cuore of Milan in Piacenza (2.6 percent), Politecnico di Milano (1.6 percent), The National Institute for Nuclear Physics (0.5 percent), others (1.5 percent).

ART-ER operates on a not-for-profit basis in the interest and on behalf of its members and acts in conjunction with the strategic planning pursued by the Emilia Romagna Region. ART-ER prepares annually two documents: the Consortium Annual Program (PAC) - and the Annual Program of the Emilia Romagna Region – PAR (ART-ER 2020).

PAC results from the collaboration between ART-ER and its members/shareholders. Each PAC document outlines strategic actions related to policies and interventions for local development, attractiveness, and innovation. The activities outlined in each PAC document cover designing interventions and supporting "inter-institutional policies," that is, policies involving a plurality of regional stakeholders.

The draft of each PAC document involves coordination and balancing of the priorities and interests of the plurality of stakeholders involved.

The interventions envisaged in a PAC document are implemented along the following five lines of action:

1. Development of the regional innovation ecosystem.
2. Actions and tools for open innovation.
3. Participation in European initiatives.
4. Promotion, attractiveness, and internationalization.
5. High skills development and talent attraction.

Through the PAC document, ART-ER contributes to coordinating and supporting the regional innovation ecosystem, promoting new economic models (e.g., green economy, blue economy, circular economy, urban regeneration) and sustainably strengthening manufacturing competitiveness. This approach allows the social and environmental dimensions to be considered essential components of regional sustainable development.

Each PAC document identifies initiatives consistently with the Annual Program (PAR) drafted by ART-ER for the Emilia-Romagna Region. Each PAR is based on the Region's Three-Year Plan (*Programma Triennale Regione Emilia-Romagna - PTER*) and aims at broadening and/or complementing it. For instance, the PAR for 2020 included 60 projects, which had to be identified according to a scheme agreed upon with the Emilia Romagna Regional Government to make sure that projects were in line with the strategic goals contained in the Region's Three-Year Plan (PTER) Finally, the PAC specifies the total financial cost of programmed activities, whose delated breakdown is left to subsequent implementation documents.

Overall, ART-ER operates through concerted policy interventions and acts in the interests of its shareholders, in line with the priorities and strategic choices decided by the Emilia-Romagna Regional Government.

In short, *ART-ER embodies a model of an innovation agency whose governance is neither completely top-down nor bottom-up*. Rather, it is a model that, in line with the longstanding regional tradition of concerted policy interventions (Bianchi e Giordani 1993; Bianchi and Bianchi 2019), promotes the participation of members and stakeholders in the design and implementation of projects and policies. This organizational model aims to support the activities of ART-ER's members through the promotion of coordination mechanisms around priority areas and joint use of resources.

An organizational model might suffer from two main limitations. First, the organizational capacity and relative weights of members and key stakeholders may vary. Not all participants in programming activities are equally capable of organizing their interests (Di Tommaso 2020). When the relative weights and organizational capacities of stakeholders are unbalanced, the risk is that the demand for industrial policies may be captured by "regressive coalitions" that effectively prevent any change, have vested interests, and offer political consensus to retain their privileges and partial interests (Bianchi and Miller, 1996).

The second limitation of this organizational model, which is to some extent related to the one mentioned above, is linked to the ex-post legitimization of interventions. In other words, major decisions on interventions (policies) to be implemented may be taken by influential politicians and entrepreneurs outside the formal structure of the innovation agency. In that case, the Members' Assembly would only function as a ratifier of decisions taken elsewhere.

Overall, ART-ER's internal structure and its operational model based on stakeholders' participation are both instrumental to achieve the objectives collectively defined. However, the model may suffer from drawbacks preventing the implementation of initiatives that effectively contribute to the Region's sustainable development. This may be particularly the case when strong and influential stakeholders drive the decisions of the Members' Assembly or make the Assembly legitimize *post factum* decisions taken elsewhere.

Another issue to be emphasized when assessing the activity of ART-ER from a comparative perspective is the role of the existing manufacturing ecosystem. For Emilia Romagna, technological and manufacturing context (a long-standing tradition in heavy and high-tech manufacturing, together with the positioning of several activities as subcontractors of high-value-added segments of production) might have favoured the emergence

of crucial know-how and capabilities. This triggered the emergence of a social and manufacturing context that may have been an important condition for successful networking initiatives. As the interviews with several ART-ER stakeholders have emphasized, *ART-ER has been relying on 'factors of production' already in place* – from firms to universities – and, as a result, the main activity needed was to connect them and promote virtuous networks and hubs. In regions not sufficiently endowed with “factors already in place,” the network-based operational model of ART-ER may not be an adequate one.

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Cambridge Industrial Innovation Policy (CIIP) is a global, not-for-profit policy group based at the Institute for Manufacturing (IfM), University of Cambridge. CIIP works with governments and global organisations to promote industrial competitiveness and technological innovation. We offer new evidence, insights and tools based on the latest academic thinking and international best practices.

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