

Danube Transnational Programme

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Interreg
Danube Transnational Programme
Smart Factory Hub



POLICY RECOMMENDATIONS

SMART FACTORY HUB - Improving RD and business policy conditions for transnational cooperation in the manufacturing industry

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Executive summary

Within the **SMART FACTORY HUB Project 10 countries**: Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Romania, Serbia, Slovakia and Slovenia, are selected to show, how they operationalized their **smart specialization strategy and enhance innovation in the context of smart manufacturing**.

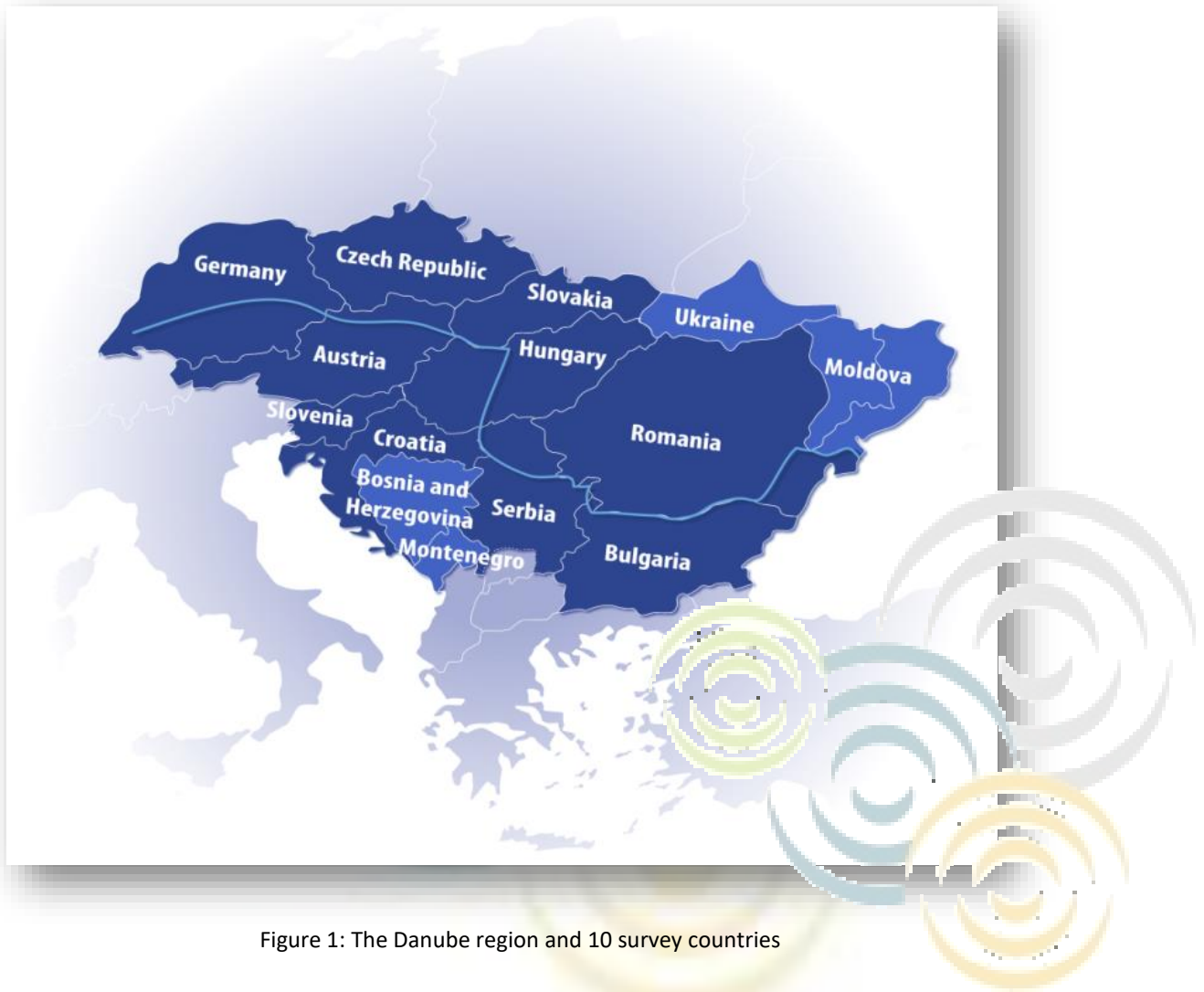


Figure 1: The Danube region and 10 survey countries

Policy recommendations report aims to provide common overview of (i) current status of Digital transformation in Danube region, (ii) challenges and difficulties related to the process in the region, (iii) good practices in the region in order to highlight cross-regional differences, diversities and advantages in order to inform about possibilities to align national policy instruments with transnationally identified best practices.

This policy recommendation report is based on a regional mapping reports to the smart specialization strategy and reports for improved funding instruments form each single country.

Current status of Digital transformation in Danube region

Strategy Background

All national Strategies are in line with the European Strategy and implemented based on support measures, except Serbia where the national strategy is still being prepared. In the following map the implemented national strategy of each country and policy, initiatives are identified.

The main key message, related to the implementation of the national strategy, was that in the Danube region, the SMEs awareness about the Smart Specialization Strategies and their involvement in preparation is not sufficient, while there are big differences in their awareness and involvement on a country-by-country level. On the one hand, this may have negative effect on the overall competitiveness of the defined Danube region that based on SMEs and on the other hand, it may lead to the increase of the gap between more developed and less developed countries (from the Smart manufacturing viewpoint) in the Danube region.

National Strategies and Policy Initiatives on Smart Factory

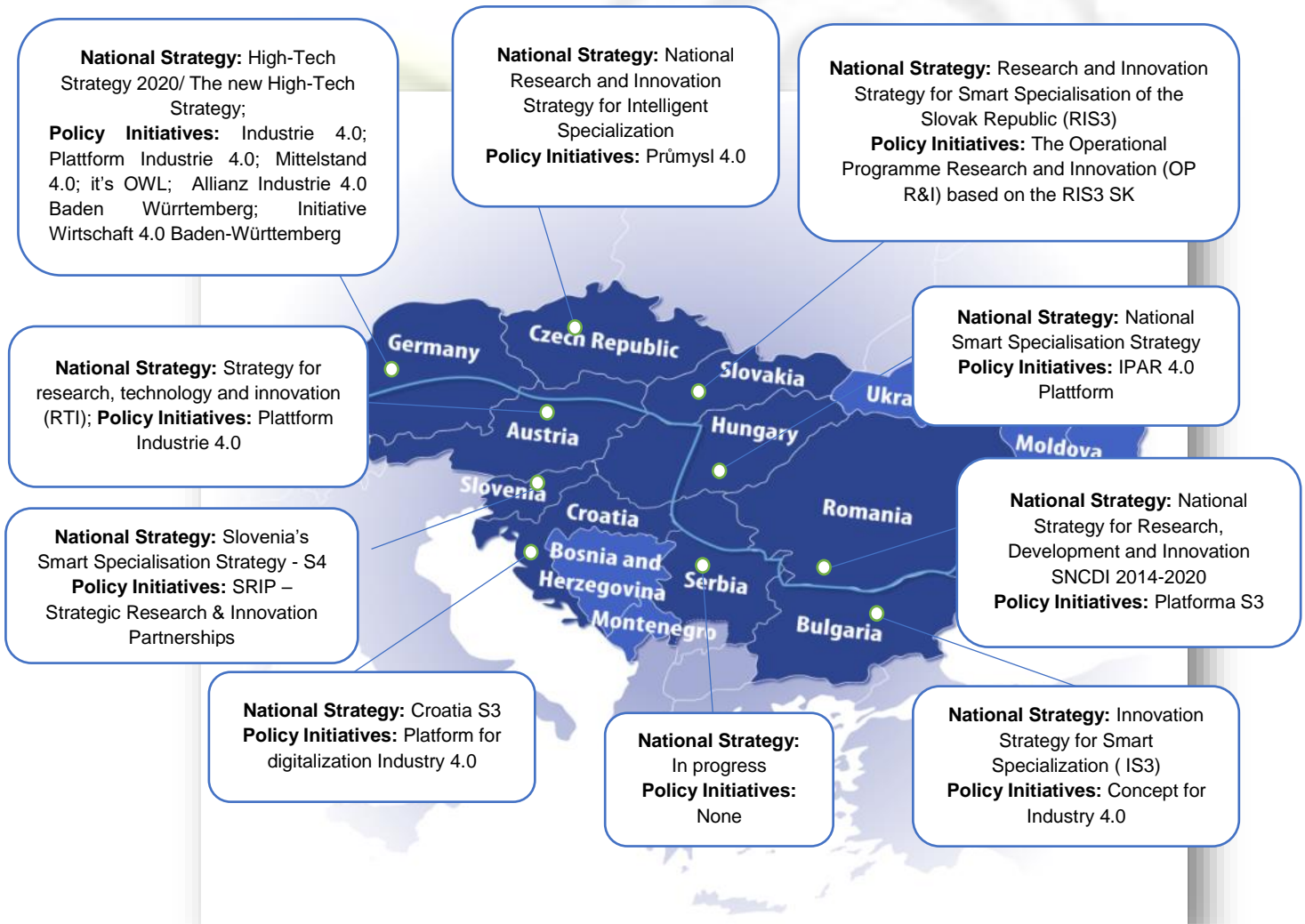


Figure 2: Overview of national strategies and policy initiatives on smart factory

Smart Factory support schemes and programmes

Favorable financial environment is very important for development of each company. The importance is also reflected by the fact that the financing of SMEs one of the main topics of the discussions, documents and programs on entrepreneurship at EU level. The maximum grants given per project is an important indicator.

Each country is endeavoring to support SMEs with special designed funding schemes. The maximum grants given per project is one important indicator for development of sustainable and smart partnership. The highest max. grant can be observed in Slovakia (up to 5 Mio. EUR) and Czech Republic (up to 3,7 Mio. EUR). Germany, Austria and Romania support with max. two Mio. EUR cooperative research projects, followed by Bulgaria with 1,4 Mio EUR for scientific projects. Croatia and Slovenia provide up to 0,5 Mio EUR funding per project.

National funding schemes - Overview



*Max. grants: Max grants for cooperative research projects related to smart factory (Call Year 2017)

NFB: National Funding Body

Figure 3: Key indicators of national funding schemes related to max grants and topics related to smart factory

Benchmark of critical factor SME in the macro Danube region

Among the EU Member States, the relative importance of large enterprises was at its greatest in Hungary and Germany in 2013, as these enterprises contributed more than two thirds of the total value added generated in the manufacturing sector.

SMEs enterprises made a considerable contribution to manufacturing value added in Bulgaria and Croatia, where the relative weight of SMEs enterprises in manufacturing value added was higher than the contribution made by large enterprises.¹

Table 1: Value added by enterprise size class, manufacturing (NACE Section C)

Value added by enterprise size class, Manufacturing (NACE Section C), 2015

	Total (EUR million)	SMEs	Micro	Small	Medium-sized	Large
		(% of total)				
EU-28	1 900 000.0	40.7	6.1	13.3	21.3	56.8
Bulgaria	6 213.1	51.0	5.5	15.9	29.5	49.0
Czech Republic	35 823.8	39.5	6.9	9.7	22.8	60.5
Germany	534 931.9	32.1	3.2	9.3	19.6	67.9
Croatia	4 924.3	54.0	8.9	17.7	27.4	46.0
Hungary	21 918.8	30.6	3.8	8.4	18.4	69.4
Austria	51 585.0	40.6	4.4	11.8	24.4	59.4
Romania	15 357.5	38.0	4.0	10.9	23.1	62.0
Slovenia	7 159.7	51.1	9.7	14.5	26.8	48.9
Slovakia	12 758.6	37.1	6.6	9.4	21.1	62.9

(-) not available

Source: Eurostat (online data code: sbs_sc_ind_r2)

eurostat 

EU S3 actors play a crucial role in regional and national smart specialisation strategies. They specifically:

- participate in entrepreneurial discovery process,
- contribute to the development of S3 strategies and their implementation,
- provide advice on how to match regional development needs with R&I and vice versa,
- support particular technologies, industries or clusters,
- provide an adequate innovation ecosystem,
- form the quadruple helix of innovation actors,
- are involved in international networks and thus they add the needed external and outward-looking dimension to smart specialisation strategies.

While larger companies have easier access to consultants assisting them with such issues, SMEs typically do not have financial means and necessary human resources to do the same.

¹http://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacturing_statistics_-_NACE_Rev._2#Size_class_analysis

Challenges and difficulties related to the process in the region and recommendations for improving the policy environment and funding /support instruments

It showed that the defined Danube region is not a homogeneous region and even there is the difference in the economic state of each country as well, they are facing with similar bottlenecks, challenges and limitations in implementing the RIS3 instruments description.

For most of the countries, RIS3 and RIS3 instruments are only coordinated on national level. Structural fund management and intelligent specialization are concentrated at national level with very limited **involvement of local authorities** - the links between the Structural Funds and the identified smart specialization priorities are often formal without taking into account the real effects and impact on the innovation development of the regions. As well as **limited stakeholders' involvement** - thematic areas were selected without active involvement of entrepreneurs and researchers in the process of entrepreneurial discovery. There is formal stakeholder engagement mechanisms but also there is a mismatch between the perspectives of the business, academia and regional authorities on the development and implementation of smart specialization.

A significant improvement would be to include and involve actively local authorities, stakeholders and especially SMEs in the strategy planning of support instruments. Increase dialogue with all relevant stakeholders when developing funding procedures before defining selection criteria.

One of possible ways to include all is to form national teams for development and implementation plan for Smart manufacturing.

There is no existing of real monitoring and measurement on the impact. The statistical indicators used do not sufficiently reflect the priorities and specificities of the different regions in the countries, which leads to a limited interest of the beneficiaries in many sub-priorities. Indicators for monitoring and evaluating thematic areas are too general.

Instruments should address challenge of coping with new technological trends and supporting SMEs at the same time, as there is always a lack between the development of technologies and their implementation in SMEs.

It is necessary to develop smarter monitoring indicators, which are closely related to each thematic priority of IS3; as well as continue activities such as the innovation check to get SMEs first experiences with R&D and thus motivate them to participate in further research activities.

It is also important to impose targeted efforts to foster cooperation between business and research institutions.

Encourage businesses to increase demand for innovation and research (tax incentives, public procurement policy, special financial schemes to promote cooperation with universities and public research institutes, etc.

Put emphasis on improving the quality of the applied instruments and schemes targeting science-industry relationships (like TTOs, student thesis in companies, industrial PhDs, a voucher system for which companies can purchase research and innovation in universities and institutes. etc.)

National funding instruments are representing burden, especially for production oriented SMEs that have other daily and very specific problems and workload. Therefore, the professional support for project management, administrative procedures and other specific knowledge is needed from external providers, since those SMEs don't have in-house personnel with this kind of knowledge and skills.

Nevertheless, it is not easy for SMEs to choose the right external providers because there are only a few specialists have both (technical and administrative) knowledge. Acquiring of independent experts for the purpose of evaluation of research projects is a problem because most experts are in potential conflicts of interest, and currently in most of the Region countries there is no option of engagement of foreign experts from other countries.

Strengthen national and entrepreneurial investments in HR, especially technology transfer professionals, which should reduce the difference in mind-set between science and industry
Improve human capacity, with a special focus on young scientists and inventors (start-uppers) – internationalisation and relevance to local business and social demands should be the key selection criteria.
Create a network of experts for evaluations of project proposals or providing tailored advice and technical support if needed
Possibility of bilingual project applications and evaluations by foreign experts.

National funding instruments are generally providing rather low-level of co-financing, especially for investment related activities and resources, which makes the instruments less appealing to SMEs. The funding rate is often too low. Too many projects are tried to be funded with too few funds.

There is a disproportion between investments from EU structural funds and national R&D funding as well as lack of venture capital to support frontier research.

There is lack of very concrete, low complexity, low budget co-financing for concrete technology transfers and "solving problems" at SMEs.

The financing of programmes should be based on strategic theme management (effectiveness) and the optimisation of administrative efficiency.
The distribution of support should not only be from the territorial point of view but also from the point of view of manufacturing industries. The range of industries should take into account real production and innovation potential - sectors with potentially the highest degree of innovation need to be clearly defined.
Initiate funding instrument for very concrete, low complexity, low budget projects with the goal of supporting SMEs in digitalizing their production processes.

Many SMEs don't have information about the support they could receive, the administrative effort linked to those support instruments often due to formal checklists and the time between application and funding start. The problem resulting from a long time between application and start of funding gets even more serious combined with the absence of the possibility of so called "pre-financing", which means, the SMEs always have to work on their own expense in the beginning.

The Smart manufacturing as a topic as well as RIS3 could be perceived much better among SMEs in the Danube region, therefore this area needs to be promoted and supported by information campaigns, knowledge transfer, technology transfer and other supporting actions.

A significant improvement would be the reduction of administrative costs and the possibility of "pre-financing". Increasing max. funding rate to close the gap of co-financing to reduce financial risks for SMEs.

Calls for proposals involve complex administrative procedures, due to which evaluation and contracting of projects is lasting arguably long and often causes delays or even waiver of a project applications.

Entrepreneur's needs were poorly or even were not recognized and it often happens that it is more important to satisfy the form of the tender document than the quality of the project itself.

Identify the needs of entrepreneurs and apply them to programs (to fund not only purchase of equipment and machinery but research, development and marketing of innovative products, development of skills and competences).

Simplifying the tender procedure and reducing the required documentation for the application would allow great progress.

Some rules not to be so restrictive - such as implementation of procurement procedures for economic entities that are not obliged to procure procurement under the law on public procurement (private entrepreneurs). In such cases, procedures are prescribed by the Common national rules, specifically "procurement procedures for economic entities that are not subject to the public procurement law". The procedures are too complicated, unclear, incomplete and often refer to the provisions of the public procurement law.

In specific cases, allow investors to procure technology outside the public procurement law. In this case, the relevant institution would take over the role of the coordinator. That would have some positives as more efficient procurement process, less bureaucratic burden and higher flexibility in choosing a supplier.

Business faces challenges regarding support procedures and the link to smart specialization. Most national funding instruments for research funding have mainly very good funding conditions for SMEs. Thus, the co-financing often is a financial risk for SME.

Imbalanced rights and obligations of contracting parties (in the contracting phase): SMEs have to take all the risks and obligations – versus - the financing authority is able to do almost anything and is transferring all of the risks to the SME.

SMEs are facing variety of challenges when it comes to the implementation of Smart manufacturing technologies, but the most important two are related to investments and lack of information/knowledge. Many organization's still struggle to make the most of opportunities due to lack of knowledge or difficulties to find finance. This is the case particularly for SMEs: only 20% of SMEs in the EU are highly digitised. Slow diffusion of digital technologies poses a risk to the EU's ability to compete in the global economy. To address this challenge, Digital Innovation Hubs have a key role to play.

Initiate funding support for Digital Innovation Hubs that will be able to support production oriented SMEs with services needed, such as: technology scouting, developing digital transformation skills, support in financing/funding,

Good practices in the Region

The region consists of economical strong countries and some of them lagging behind in innovation and education. However, in the region, the manufacturing sector plays an important role in Czech Republic, Germany, Hungary, Austria, Slovenia and Slovakia, while in Romania and Bulgaria is this sector under represented.

In Austria industrial production processes are included as important area in the RTI Strategy of Austria (RIS3), which means that the topic is always eligible for financial and support instruments. The implementation of RTI Strategy is responsibility of the regional federal states and not only responsibility of the government, thus regional federal states suggest as Upper Austria are creating regional funding schemes with topics such as digitalisation, which fits the regional economy. Funding topics considered the different levels of digital maturity, on one side for industrial companies to make a start in the direction of digitisation and a rapid connection to digital change, and other side for companies with an advanced degree of automation to make better use of their data and add value. The awareness about the RTI (RIS3) programme, financial instruments and support schemes is relatively high among beneficiaries and target groups as well as their interest to participate in those open calls.

Slovenian approach to S4 has been recognized as SMART STORY! The European Commission included Slovenia in the Handbook as an example of good practice. The honor of being featured in the document was given to 20 excellent examples among 273 EU regions. Smart factories is one of the nine areas in the RIS3, which means that the topic is always eligible for financial and support instruments. The awareness about the S4 programme, financial instruments and support schemes is relatively high among beneficiaries and target groups as well as their interest to participate in those open calls. There is a variety of funding and other support instruments available, which could meet different challenges in SMEs. It seems that the Ministry responsible for S4 strategy implementation is having a very good strategic approach in translating the strategy into concrete measures and action plans.

While in Germany innovation vouchers are popular due to their low administrative effort, as are in Slovenia. Furthermore, everything about Industry 4.0 is important, especially mass customization. Besides the innovation vouchers a digitalisation premium also is a good support instrument. Centre's for the development of cooperation are good practices.

In Croatia funds are provided under the OPCC 2014-2020. Largest and most complex tender for encouraging R&D and innovation projects with the identified priority thematic areas and cross-sectoral themes of the RIS3 strategy is 'Increase of development of new products and services that result from R&D activities'. Also under OPCC, financial support to SME's and large enterprises envisage calls "Centre's of Research Excellence performing excellent science" and "Strengthening capacities for R&D and innovation". ESIF Venture Capital Fund is essential for development of Croatian economy, by encouraging investments in equity of fast growing SMEs whose development is based on new technologies and innovation in sectors with high growth potential, especially those specified in the RIS3 strategy, since Croatia features one of the lowest rates of private equity and venture capital supply across the EU and venture capital is almost non-existent in the country.

There are specific R&D calls in the areas specified in RIS3 Strategy in Slovakia. OP R&I supports projects aimed at deploying smart solutions on existing technologies, as well as acquiring the new technologies needed to implement smart solutions and the creation of intelligently managed, interconnected autonomous systems. With its focus, the OP R&I supports the principles of the Smart Industry 4.0 concept and offers to Slovak entrepreneurs realizing of the innovative smart investments and implementing of the intelligently managed

technologies and systems in their production lines. R&D State programmes are one of the main instruments, which should contribute to the development of society and help solving pressing societal challenges. Main principle is to support multidisciplinary research and support cooperation between academia and business. Positive trend is the increasing interest from the side of Slovak entrepreneurs and better quality prepared projects.

While in Serbia where the national strategy for smart specialization is still being prepared, there do exist several sub-funding lines (incl. mini-grants, matching-grants, collaborative grant scheme, innovation vouchers), as well as schemes that mainly support research and innovation-oriented schemes, particularly early-stage financing and technology transfer. It's planned to launch R&D programmes in selected application areas important for the country and from priority areas declared by the relevant strategies, but at the moment, funding schemes have four main orientations: basic research, technology transfer, multidisciplinary areas, and innovation.

It is evident that support environment plays a crucial role to translate the Strategy for smart specialization throughout well-designed programs for SMEs. Therefore, good practices represent a positive direction and examples among region countries.

Development of a policy environment and funding/support instruments for Digital Innovation Hubs

Digital Innovation Hubs are a key priority in the Digitising European Industry Initiative adopted by the European Union in April 2016. Building on the positive impact that DIHs already have on the digital transformation of European companies, the European Commission wants to further support their actions within the next long-term 2021-2027. One of the key objectives of Digital Europe will be to ensure a wide use of digital technologies across the economy and society. Digital Innovation Hubs will be the means for implementation to ensure the digital transformation of all businesses and also public administrations.

The Digital Europe Programme will thus fill the gap that currently exists in the market, as many companies still lag behind in the adoption of technology. Therefore, Digital Europe will be focused on the broad roll-out of digital technologies (especially AI, HPC and cybersecurity) and digital skills to the entire economy, not only to companies considered innovators and early-adopters, and to public administrations. Member States will be essential in the selection process of Digital Europe, since they will be responsible for designating potential Digital Innovation Hubs.

There is big difference in the number of Digital Innovation Hubs in Danube region. Member states if don't have implemented already national DIH strategies as part of their digitisation strategies they are planning to implemented it as soon as possible. Often these national or regional DIH infrastructures are linked to their Smart Specialisation Strategies.

Germany already has 28 fully operational DIHs and 25 are in preparation. Slovenia has 7, Austria has 5 and Czech Republic has 4 fully operational DIHs. Croatia, Hungary and Serbia have per 3 fully operational DIHs and Slovakia, Romania and Bulgaria none, but have in preparation. ²

² List of all Digital Innovation Hubs can be seen on Smart Specialisation Platform: <http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>

Digital Innovation Hubs- Overview



Figure 4: Overview of Digital Innovation HUBs in Danube Region

In economically strong countries such as Germany and Austria National Strategy of Digital Transformation is already implementing as part of their digitisation strategies and political framework programme and financial/support instruments for digital innovation hubs or other types of clusters is within already existing programmes or programmes which are currently being set up.

In countries where the importance of Industry 4.0 and digitalization has been recognized, such in Slovenia, support for DIHs is not planned at the national level for the time being, apart the call Digitalization 2019-2023, but support for DIHs shall be implemented in the future Structural funds, whose Regional development strategies are being currently prepared. Those funds will be combined with the EU funds for the areas that are commonly identified as priority areas.

In Croatia, The National Strategy of Digital Transformation is planned to be prepared in Year 2019 and will have in focus fostering innovation-led economic development involving the digitisation of industry as set out in the smart specialization strategy (including complementary investments in building up Digital Innovation Hubs). As part of the 2017 European Commission's "Smart Factories in New EU Member States" project with the aim of selecting at least 30 DIHs in EU13 to participate in the training program and the preparation of the DIH Action Plan, 3 DIHs were selected from Croatia.

Slovakia at the moment is planning to conduct a feasibility study on the Digital Innovation Hub project and on its base will be decided how to support the DIHs and Bulgarian Smart Specialization Strategy and Strategy Industry 4.0 are outdated and even not relevant. Both Strategies together with funding and support instruments should be revised. For now within their IS3 there is no foreseen support for digital innovation hubs.

For easier and maxim use of digital technologies across the economy and society it is particularly important to achieve synergy with cohesion policy, Union programs such as Horizon Europe, FP9, Invest EU fund and create an adequate management system for all instruments and bodies responsible for creating, implementing, monitoring and evaluating instruments to ensure avoidance of overlapping. They should be harmonized to allow for the implementation of future strategic goals and financing.



If you are interested in the detailed documents, find them on our homepage:
<http://www.interreg-danube.eu/approved-projects/smart-factory-hub>
under the **project outputs**.