DELIVERABLE T1.4.3

Strategy Roadmap
for boosting AVM capacity building in CE

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1. Aim of the Report

The elaboration of a transnational Strategy Roadmap for boosting AVM capacity building in Central Europe has been handled as a key cross-cutting issue along all phases of InnoPeer AVM project implementation.

The main objectives of the InnoPeer AVM Roadmap are:

- to generate sustainable AVM/Industry 4.0 (I4.0) business cases in CE companies based on successful digital transformation and change management

- to enable CE companies for enhanced integration in transnational I4.0 value chains

- to strengthen the position of Central Europe on the European Digital Single Market

This report describes the topics addressed in the frame of the InnoPeer AVM Strategy Roadmap and represents the result of the transnational roadmapping process conducted by the InnoPeer AVM project partnership. It reflects contributions from Advisory Board consultations as well as inputs from key stakeholders, which were collected throughout the regional action planning process in all parts of the Central European project region.

2. Overview of the InnoPeer AVM Roadmapping process

The InnoPeer AVM Roadmapping process was based on inputs from several project activities:

- A transnational benchmark analysis which compares the regional challenges in digital transformation in the single project partner regions (Deliverable 1.1.3)

- Four strategic stakeholder workshops organised in conjunction with partner meetings in Hungary, Germany, and Italy (Veneto, Emilia Romagna) to discuss aspects of digital transformation in the Central European countries with regional key stakeholders (Deliverable 1.4.1)

- Three action planning/roadmapping workshops implemented at consortium level (Deliverable T1.4.2)

- A dedicated tele-conference with InnoPeer AVM Advisory Board members organised in December 2019 (included in Deliverable T1.3.3)

- Final discussion and completion of the Strategy Roadmap document in the last semester of InnoPeer AVM project implementation (included in Deliverable D.M.3.1)

- Presentation of the main conclusions from the roadmapping process at the final project conference which was held as an online event in May 2020 (included in D.C.4.2)

Insights from each single process step were continuously enriched at transnational CE level in the course of the strategic roadmap development which led to the final document at hand.

The whole Strategy Roadmap package is made available on the project website to ensure wide dissemination through the project channels and continuously used as a basis for discussion with regional stakeholders and policymakers.

3. Strategic reference frame of the InnoPeer AVM Roadmap

The strategic frame for InnoPeer AVM roadmapping is shaped by several influencing parameters, such as the global megatrends in digitalisation, the European strategies for the digitalisation of industry and a Central European strategic perspective up to 2030. A clear understanding of the relevant framework conditions for the digitalisation of Central European SMEs is required to answer fundamental strategic questions and reach the intended capacity building impact for Central European companies. These questions are:

- How can regional SMEs from Central Europe get involved in a continuous upskilling process to obtain key knowledge for successful digital transformation and business development in line with their actual qualification demand?

- Which training target groups need to be addressed by tailored qualification measures in order to ensure the efficient transfer of digitalisation knowledge to practical application in Central European companies?

- How can the InnoPeer AVM qualification programme be sustainably integrated in vocational and higher education and continuous qualification frameworks to make this knowledge widely available for SMEs from all Central European regions?

The following section provides an overview of the basic strategic documents that were analysed by the InnoPeer AVM partnership as a starting point for the strategic roadmapping process.

3.1. DESI Index to benchmark digital competitiveness of Central Europe

The Digital Economy and Society Index (DESI) is a composite index that summarises five main indicators of digital competitiveness (connectivity, human capital, use of internet, integration of digital technology, digital public services) to benchmark the digital performance and track the progress in digital competitiveness for each of the EU member states. The fact that the key dimensions of the InnoPeer AVM qualification approach for SMEs (digital technologies, human resources, business models) coincide with a sub-set of DESI indicators, i.e. "Human Capital (DESI dimension 2)" and "Integration of digital technology (DESI dimension 4)", makes it possible to align the CE-focused InnoPeer AVM project results with the EU-wide DESI monitoring frame. For this reason, the InnoPeer AVM roadmap considers the DESI Index as a main reference and starting point in the strategic assessment of digital competitiveness of Central European countries.

The diagram below is based on the DESI report 2019 presenting an overall assessment of digital inclusion and digital skills in the societies of Central European countries compared to other EU member states.
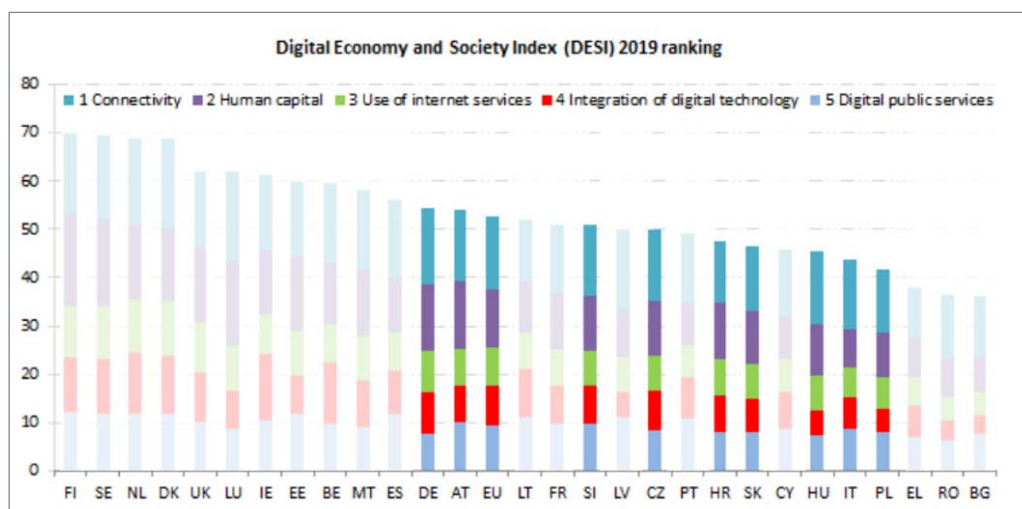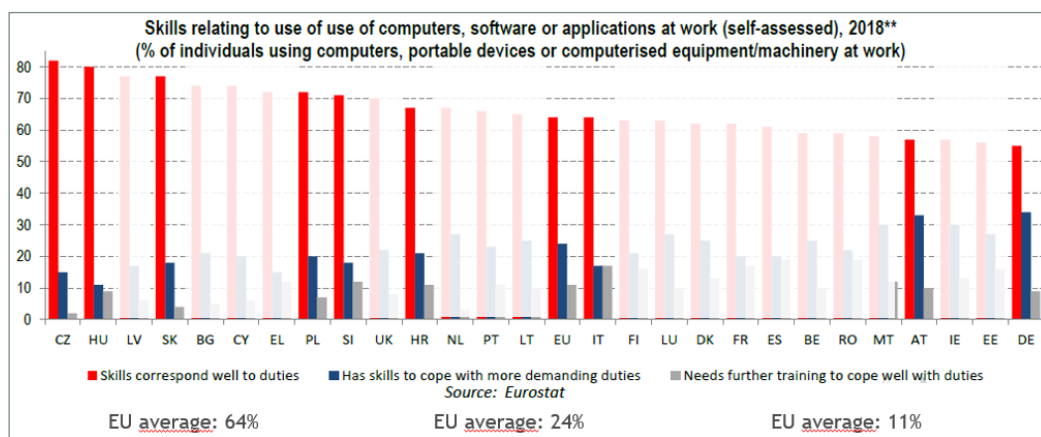

Source: DESI Report 2019, further elaborated by the authors of this report

While Northern and Western European countries like Finland, Sweden, the Netherlands and Denmark are in a leading position being the EU member states with the most advanced digital economies, the Central European countries range from the middle to the lower end of the general DESI national level ranking. In a comparison among Central European countries, the diagramme already indicates some differences related to the single indicators that form the DESI index, particularly concerning "Human Capital (DESI dimension 2)" and "Integration of digital technology (DESI dimension 4)", i.e. those aspects of digital competitiveness, which are particularly addressed in the InnoPeer AVM project.

Another important input for the InnoPeer AVM roadmapping task comes from the self-assessment of the labour force regarding their digital skills, which is investigated in the Human Capital chapter of the DESI report. With view to the InnoPeer AVM objectives of advancing the qualification of Central European SMEs for digital transformation, this DESI result indicates the different levels of awareness among potential training target groups from Central Europe regarding their own demand for upskilling.

Source: DESI Report 2019 – Human Capital, further elaborated by the authors of this report

It shows that a divide exists across the Central European region: In some Central European countries shown on the left side of the diagram, workers' self-confidence relating to their digital skills vis-a-vis recent job requirements is high, while, at the same time, the willingness for further training to cope with new challenges is below EU average. In contrast, in other Central European countries where greater digital capability levels are noted, there is also a greater awareness about existing qualification demands.

With regard to the transnational InnoPeer AVM Strategy Roadmap, the wide spread of the awareness level for digital upskilling demand leads to the conclusion that there will not be a "one fits all" recommendation or solution how to increase the qualification of regional SMEs located in different CE regions and their employees working at different organisational levels from production workers to corporate management.

This finding is reflected within the InnoPeer AVM workplan by the development of two types of strategic outputs. One output element concerns the Regional Action Plans for each partner country or region in which the specific regional framework conditions and economic development potential are analysed. These analyses are then used as a basis for the definition of tailored qualification measures to meet the actual upskilling demand of regional SMEs. The other strategic project result is the Transnational Strategy Roadmap presented in this report which targets the common challenges and transnational policy recommendations to advance the qualification and preparedness of SMEs for digital transformation from a transnational perspective.

This set of two interrelated strategic documents (Regional Action Plans + Transnational Strategy Roadmap) serves as a toolkit to foster the sustainable transfer of the project results to the regional as well as macro-regional innovation policy level in each of the project partner countries. The dissemination of the InnoPeer AVM approach and examples of partner region strategies will allow for the sustainable transfer of the InnoPeer AVM project approach also to other regional settings in Central Europe.

3.2. Megatrends in digitalisation

Digitalisation is one of the huge societal challenges of our times. Therefore, the impact of digitalisation on companies has recently been investigated in several extensive studies and analyses, some of them prepared to analyse single fore-runner countries in industrial digitalisation, others with a global perspective. None of those studies sets a specific focus on the situation of Central European companies. In the course of the roadmapping process, the InnoPeer AVM partnership has reviewed the main findings from recent research and discussed their implications for the project region to draw conclusions for the Central European situation and recommended development paths.

In 2016, the Mechanical Engineering Industry Association (VDMA),with around 3.300 member companies in Germany and Europe, presented a large-scale survey with 500+ participating member companies in the VDMA study "Industrie 4.0 – Qualifizierung 2025".

Overall, around 71% of the survey participants responded that the I4.0 qualification had recently been implemented in relevant vocational education and training (VET) programmes for their industrial sector. 62% of the responding companies had already addressed I4.0 topics in further qualification and upskilling measures.

Another main finding of this study addresses the correlation between qualification measures implemented by the companies in the field of industrial digitalisation (I4.0) and their innovation capabilities as shown in the diagramme below.
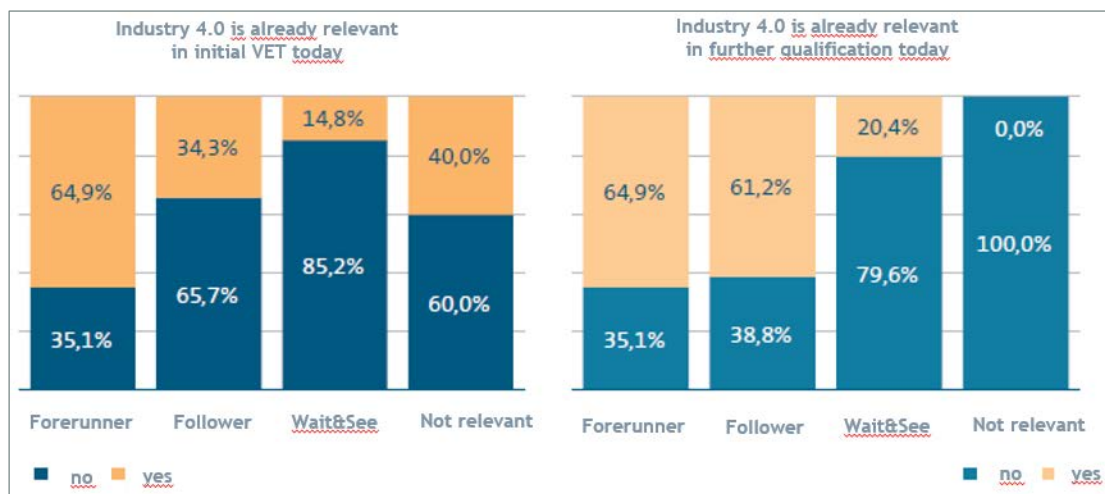
Source: VDMA 2016, further elaborated by the authors of this report

In two thirds of forerunner companies, I4.0 topics are covered by the relevant VET programmes and in further qualification courses. On the other hand, laggard companies mostly ignore the need for I4.0-related upskilling of company workers in order to keep pace with innovation leaders in their industry sector.

With regard to the transnational InnoPeer AVM Strategy Roadmap, it can firstly be concluded from the VDMA study that enhanced qualification in digital skills will be key to pushing innovation in Central European SMEs. Secondly, the findings indicate that a broad qualification initiative with specific training measures for different target groups, starting from VET training up to advanced training offers for upskilling of SME experts and managers, will be an efficient approach to empower regional companies for digital transformation.

Another recent study, the <u>Deloitte report "The industry 4.0 Paradox" of 2018</u>, presents the results of a worldwide survey including responses of 360+ executives from eleven countries, which reflects the view of top industry managers on the drivers of industrial digitalisation: According to this study, approximately one third of the participating managers indicated "finding, training and retaining the right talent" as the most relevant challenge in the context of digital transformation, followed by the need for internal strategic alignment and the adoption of new business models.

Although the target group of survey participants in this case cannot be directly linked with the Central European SME focus, it is interesting to learn that the key knowledge dimensions of InnoPeer AVM (digital technologies, human resources, business models) do to a large extent coincide with the common operational, culture-related and environmental challenges identified by the interviewed global lead company managers that are operating at the forefront of industrial digitalisation.

With regard to the transnational InnoPeer AVM Strategy Roadmap, the Deloitte survey underlines that the demand for qualified human resources and the need for adequate business strategies are the main challenges for any kind of company that tries to compete for a strong market position in times of industrial digitalisation.

Looking particularly at SMEs and their potential scope of action within the global competition for digital expertise, a promising strategic approach lies in the upskilling of existing personnel and niche strategies to adopt SME-tailored business models, e.g. as a supplier of customised digital products, small product series and related services. Actually, building the capacities of SMEs to transform and implement digital solutions at company level has the potential to strengthen small and medium-sized companies in their typical role as flexible and customer-oriented suppliers of specialised market offers – which is the pre-requisite for getting integrated into digital value chains at regional and transnational level in a longer perspective.

Therefore, the development and sustainable integration of SME-tailored training programmes is crucial for empowering Central European companies and speeding up their integration in digital value chains at regional as well as transnational level.

3.3. The DEI initiative for Digitising European Industry (DEI) initiative and its implications for Central European SMEs

Finally, the InnoPeer AVM Roadmap for advancing SME qualification for digital transformation needs to consider as a reference also other targeted initiatives at the national or transnational level, which are already in place or have emerged during project lifetime in order to align strategic goals, set up cooperation links and benefit from potential synergies.

At the European level, key topics of the InnoPeer AVM project are addressed by the Initiative for Digitising European Industry (DEI), which was founded by the EU Commission in 2016 as a key element of the Digital Single Market Strategy of the European Union. The DEI progress report of 2018, i.e. two years after the launch of the DEI initiative, summarises the status of national industrial digitalisation platforms that have been established in the last years and presents several key actions within the scope of the DEI initiative. InnoPeer AVM project aims are closely related to two topics on the DEI agenda:

- Digital Innovation Hubs
- Digital Education Action Plan

Activities in both DEI action fields have substantially progressed in parallel with InnoPeer AVM project implementation. Identifying and activating potential synergies with DEI has the potential to strengthen the sustainability of InnoPeer AVM results continually beyond project lifetime.

The basic concept of Digital Innovation Hubs (DIH) as developed within a DEI working group in 2017, incorporates several elements, which address similar aspects of SME digitalisation as the Interreg project.

The Digital Innovation Hub Model[7]
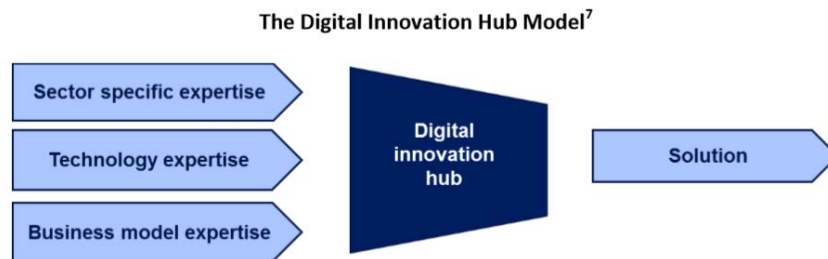
Source: DEI Working group 1, 2017

This creates a win-win situation where the sustainable transfer of InnoPeer AVM project results can become a valuable contribution for regional DIHs located in Central European partner regions or even add unique knowledge, e.g. related to human resource development and organisational change management for digital transformation. A direct connection to the European DIH network has been ensured from the beginning of project implementation since some of the InnoPeer AVM partner organisations themselves have become DIHs in their regions during project lifetime. To better understand potential DIH synergies, the Hungarian project partner PBN, which runs a DIH at regional level, organized a Hungarian expert who prepared an analysis of the state of play regarding the set-up of Digital Innovation Hubs in the Central European countries (see D.T1.3.4). This study provides an overview about the thematic focus of the existing digital innovation hubs which will be continuously used for setting up sustainable cooperation links and organise mutual knowledge transfer between InnoPeer AVM partners and regional DIHs beyond project lifetime.

With regard to the transnational InnoPeer AVM Strategy Roadmap, the discussion about the DEI key action of setting up the DIH network underlines the importance of strategic integration of the InnoPeer AVM actors and project results with ongoing strategic initiatives at national and European level. The DIH network is considered as one of the main docking points for future cooperation at the level of Central European regions.

While the main target of Digital Innovation Hubs is to offer low-threshold support for digital transformation to regional companies, the Digital Education Action Plan of the Digitising European Industry Initiative aims at advancing the capabilities of the European education system (including schools, the VET system and higher education) in order to improve digital key competences of European citizens needed for life and work in our age of rapid digital change. In parallel with improving the access and use of digital technologies in educational institutions, the availability of adequate teaching contents in digital formats becomes a key success factor in this context.

The newly developed InnoPeer AVM training programme with its modular structure of basic and advanced courses will be sustainably available on the teaching platform of VHB (Virtuelle Hochschule Bayern) beyond project lifetime with free access for registered users coming both from academia and from the SME sector. The InnoPeer AVM online courses on key aspects of digital transformation are also freely available for educational institutions via this teaching platform, thus contributing to the realisation of the DEI Digital Education Action Plan.

With regard to the transnational InnoPeer AVM Strategy Roadmap, the analysis of the Digital Education Action Plan of DEI opens a long-term perspective for the strategic orientation of educational offers for companies and citizens to cope with digital transformation. Based on the defined structure of the training content developed by the InnoPeer AVM project, different qualification paths using the new basic, advanced, practical training modules need to be defined to achieve the intended wide coverage of target groups.

4. InnoPeer AVM Strategy Roadmap for boosting AVM capacity building in CE

From a transnational perspective, the InnoPeer AVM Strategy Roadmap is oriented towards the common demand of Central European countries to establish a comprehensive qualification programme which needs to be adaptable to the actual SME demand under various regional context conditions. To support a common qualification standard and further development of the trainings on key dimensions of advanced manufacturing the InnoPeer AVM project results should become a sustainable part of a transregionally integrated system of support offers for SMEs in the process of digital transformation.

4.1. Roadmap topic #1: Establishing demand-oriented qualification paths for Central European companies based on the InnoPeer AVM project results
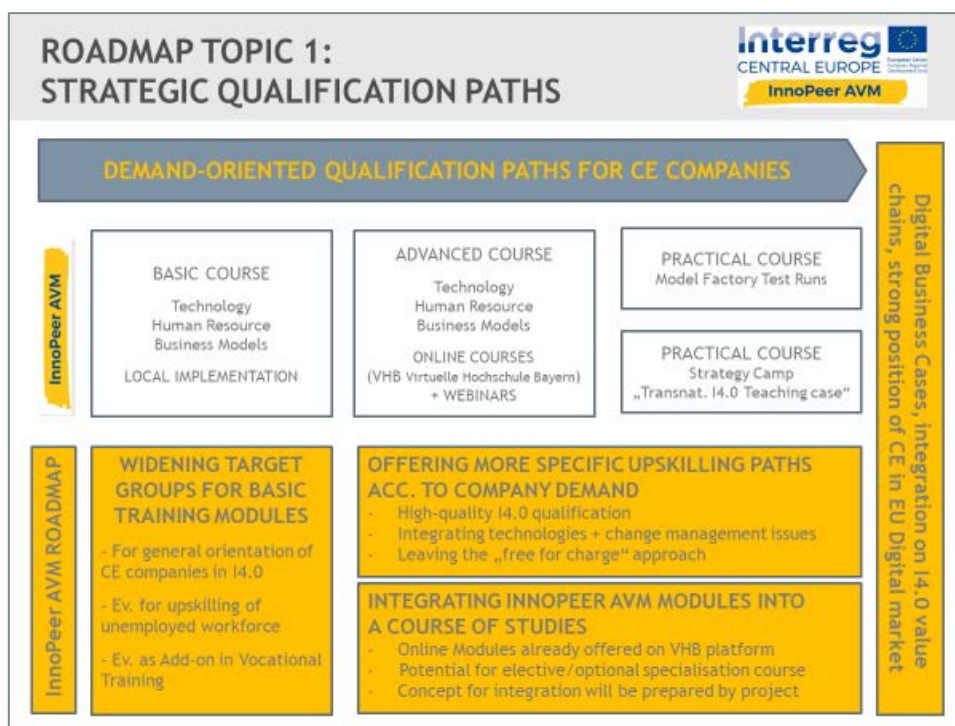
Strategic options to develop qualification paths for CE SMEs based on InnoPeer AVM results

In line with the Interreg CE programme goals and the specific objectives of the InnoPeer AVM project, the development and sustainable establishment of strategic qualification paths for companies in digital transformation and their employees represents a main topic of the Strategy Roadmap. The discussion of roadmapping inputs within the InnoPeer AVM partnership helped to identify three basic directions for further definition of demand-oriented qualification paths for SMEs:

- For the basic courses as developed by InnoPeer AVM with focus on three key competences, i.e. in the fields of digital technologies, human resource development and definition of adequate business models, the widening of the initial project target groups is considered a promising strategic approach. With InnoPeer AVM basic courses for the general orientation of newcomer companies at the beginning of their digital transformation and add-on modules in vocational training and/or as an upskilling offer for unemployed workers etc. the project results could help large SME-related target groups to cope with the digitalisation of labour world.

- To ensure the sustainability of the advanced and specialised practical courses developed by InnoPeer AVM, one development path could rely on further deepening of the training contents including individual consultancy offers in order to respond to the specific upskilling demand of single SMEs in their regional and value-chain driven business context aiming to generate economic benefit for the participating companies. Consequently, this would mean to leave the "free of charge" approach of the InnoPeer AVM project and find business partners interested in the development of marketable training products and services. With view to the role of the project partners within their regional innovation systems, this strategic option will not be followed up.

- Another strategic path leading to the sustainability of InnoPeer AVM trainings lies in the integration of InnoPeer AVM modules in existing or adapted tertiary or academic trainings. This approach again could lead to a multiple win-win situation for the InnoPeer AVM partnership, the involved educational institutions and their students: Sustainable high-level transfer of the InnoPeer AVM results will be ensured within the educational system. The InnoPeer AVM online training modules and other newly developed training materials will be available for upgrading existing curricula in the field of industrial digitalisation, and students as well as attendants from SMEs will be offered practice-oriented complementary knowledge to enrich theoretical courses of study.

4.2. Roadmap topic #2: Integrating InnoPeer AVM results in EU level / national strategies to ensure enhanced support for Central European companies in digital transformation
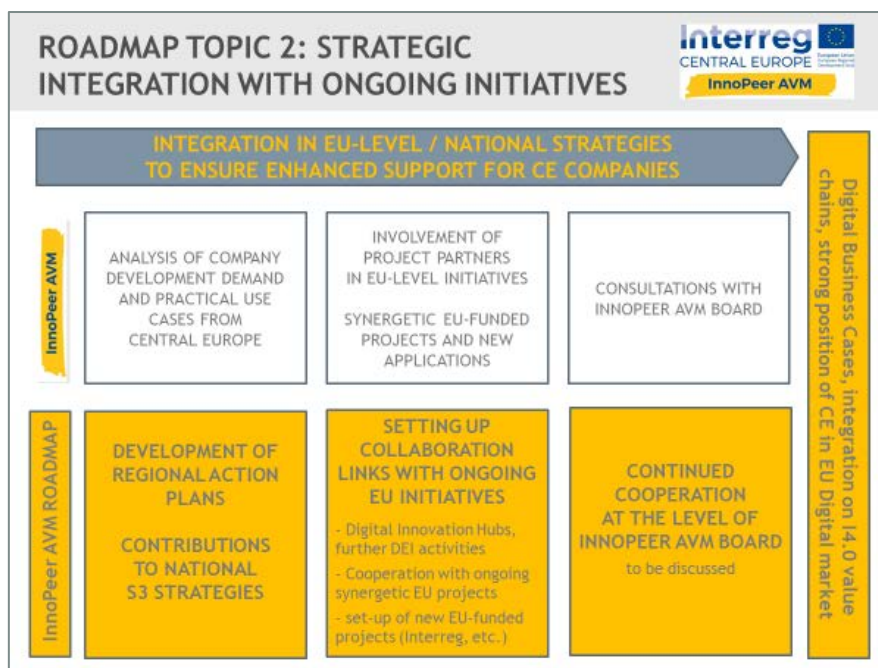
Strategic integration InnoPeer AVM results into national / macro-regional innovation policy initiatives

As the second main topic, the partnership identified the need for and a potential multiplier effect of integrating InnoPeer AVM project results into European and national strategies and ongoing strategic activities. As digitalisation is a megatrend of our times, a growing number of programmes and initiatives addresses digital transformation of SMEs.

- As far as the integration of InnoPeer AVM results into national and regional strategies is concerned, the project partnership delivers recommendations and suggestions for improved SME support in the Regional Action Plans for each of the partner regions/countries. As mentioned before, Regional Action Plans are complemented by the recommendations of this roadmapping report to be used as a strategic toolkit for briefing of regional stakeholders and policymakers during and after project lifetime. Through the partners´ involvement in national RIS3 networks and further activities of the advisory board members sustainable dissemination of project results will be ensured (see also Deliverable T1.3.10 Institutionalisation of the InnoPeer AVM Advisory Board).

- Further sustainability actions concern the development of follow-up projects that will be implemented by transnational consortia to further elaborate on the results achieved so far and to engage a wide range of interested actors from different Central European regions. At project end in Summer 2020, first follow-up projects with involvement of partners from the InnoPeer AVM consortium are already approved in various Interreg programmes allowing for the prolongation and enlargement of the successfully established InnoPeer AVM partner networks.

- Finally, all InnoPeer AVM partner organisations are committed to establish contacts and discuss synergies with ongoing or newly established initiatives that support the digital transformation of SMEs at national, macro-regional and European level. The network of Digital Innovation Hubs represents a major docking point for defining joint future activities and spreading InnoPeer AVM results across (Central) European regions.