



FINAL REPORT

INNO PROVENT PROJESCT

DRAFT VERSION



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1 Introduction

1.1 Project summary

This thematic report on adjusting calls to I4.0 requirements summarizes the experiences, practices and discussions carried out by the partners of the INNO PROVEMENT consortium.

One important event where this thematic has been discussed, was the transnational thematic meeting that took place online, due to the pandemic constraints, the 30th of June and the 1st of July of 2021, organized by Marche Region.

This report is mainly based on the contributions received by the participants during this meeting.

This transnational thematic meeting was one of the seven meetings foreseen by the project, i.e. :

- 1) Innovation in software development;
- 2) Effectiveness of public money used to support industrial R&D under I4.0;
- 3) Introducing I4.0 to traditional industries;
- 4) Definition of I4.0 public policy initiatives;
- 5) Adjusting calls to I4.0 requirements;
- 6) Market price assessment methodologies;
- 7) Definition of an I4.0 maturity evaluation matrix.

2 Methodology

Within the INNO PROVEMENT project there are seven thematic issues: each partner has the chance to explore, analyze and work out guidelines for a specific thematic. The results of this process are then shared with the other project partners. The seven thematic issues are explored along the same structure in INNO PROVEMENT.

Marche Region analyzed the thematic of **“Adjusting calls to I4.0 requirements”**, providing guidelines to the other project partners, in order to let them have a better understanding of this specific thematic.

These guidelines have been prepared based on meetings and operative workshops carried out within staff members of the Innovation Research and Internationalization office of Marche Region and meetings with local stakeholders.

After this process and the redaction of the guidelines all the project members shared their points of view in transnational thematic meetings, where all the proposals and observations from the partners have been taken into account.

The Transnational Thematic Meeting (TTM) that focused on **“Adjusting calls to I4.0 requirements”** was organized by Marche Region online on the 30th of June and the 1st of July.

Based on partner contributions the thematic host compiled the thematic paper and shared it with project partners.

Then in another important step after the TTM, Marche Region presented the results and conclusions of the previous phases to the local stakeholders throughout a thematic paper.

The thematic paper is a living document and can be updated if further relevant information comes up that is worth including in it. It is published on the homepage of the INNO PROVEMENT project (<https://www.interregeurope.eu/innoprovement/>).

3 Adjusting calls to I4.0 requirements in the INNO PROVEMENT regions

This chapter presents the contributions of all the partners to the Transnational Thematic Meeting, starting with Marche Region. As described in the Methodology chapter the further subchapters are built from reflections and contributions of the INNO PROVEMENT partners with regards to the subject.

3.1 Marche Region

Marche Region showed the results of the development policies developed during the 2014-2020 period. The POR - MARCHE ERDF 2014-2020 produced 138M€ of investments and 1,48M€ of grants. The agreements for innovation policies (D.M. 24-5-17) produced 64,6M€ using 2,1M€ of regional funds.

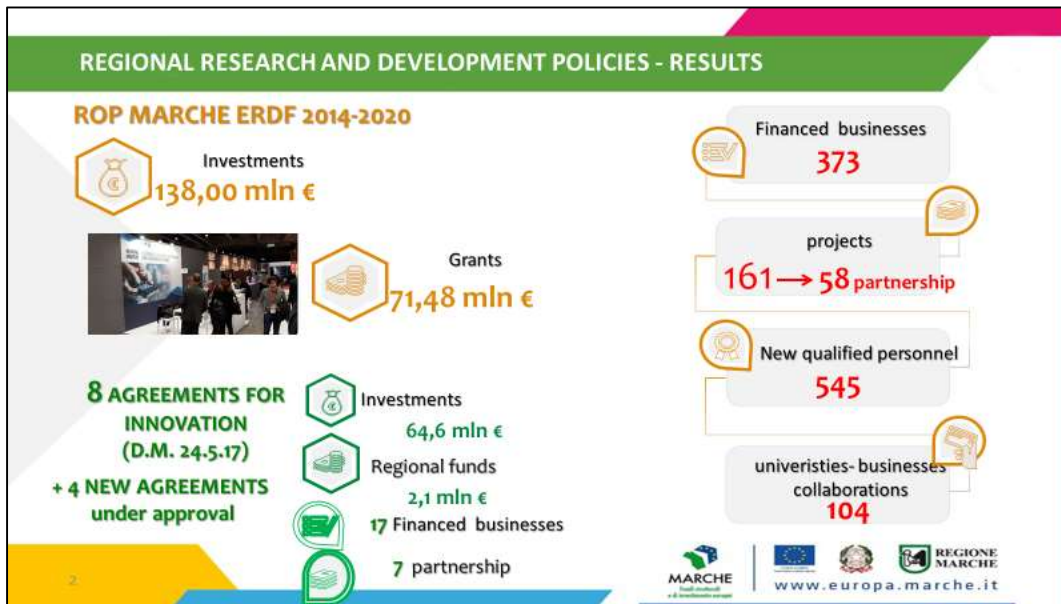


Figure 1: Regional Research and Development Policies _ Results

3.1.1 Manufacturing and Work 4.0

With this call, Marche Region aims to support the purchase of services for the technological, strategic, organizational, and commercial innovation of the companies, using the POR ERDF 14-20 funds.

However, this support must be correlated to the enhancement of the companies' human resources, so the Industry 4.0 investments are connected also to people and not only to technology.

The features of the call are:

- Total budget: 8.976.193,43 €
- Submission period: from 09/08/2017

3.1.2 Enterprise and Work 4.0

With this call, Marche Region aims to ease real processes of technological and digital innovation for SMEs, supporting material and immaterial new investments considering the National Plan of Investments on the topic of Industry 4.0.

The features of the call are:

- Total budget: 6.760.062,31 €
- Submission period: from 02/11/2019 to 04/03/2019.

3.2 Hungary

The Hungarian Ministry of finance had integrated the Industry 4.0 aspects since 2015 with the first two calls of the EDIOP (Economic Development and Innovation Operational Programme). The managing authority made a lot of changes during the 2015-2017 period to adjust the calls and realized the need to ask to other countries how they structured their calls. To do so Hungarian Ministry of Finance submitted the proposal of INNO PROVEMENT project in 2017.

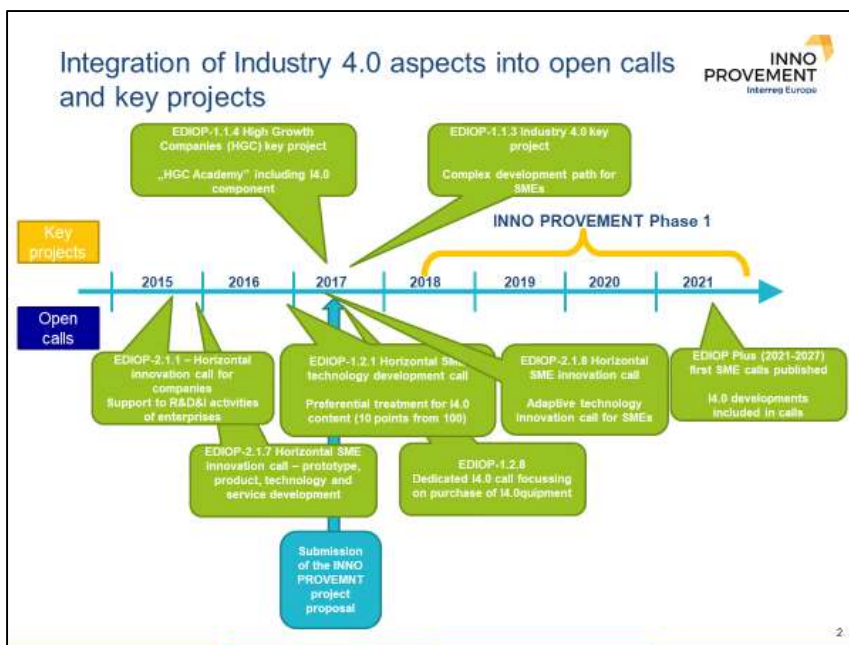


Figure 2: Integration of Industry 4.0 aspects into open calls and key project

3.2.1 Key projects

The approach, in key projects, is oriented to assist companies in the use of Industry 4.0 solutions since from the beginning of their investments process.

The call starts with an awareness raising phase that consists in campaigns, demonstrations and events. This phase is important to make a pre-selection to build a database of companies interested in adopting Industry 4.0 solutions. After this pre-selection, companies work side by side with experts to define the real needs and the project content. The last phase is the implementation, where the most reliable beneficiaries obtain funds.



Figure 3: Comprehensive approach

In key projects, for example EDIOP-1.1.3, as described above, SMEs follow a four steps path: registration, demonstration, preparation, planning.

Registration

SMEs must register themselves on the website *ipar4.hu* to answer a self-evaluation survey to check if they fulfil the basic criteria: basic lean solutions, digital stock and operation management.

Demonstration

SMEs visit Industry 4.0 demo factories and Industry 4.0 Technology center. This includes the visit of at least two demo factories and technology centre.

Preparation

In the preparation phase SMEs are supported by Industry 4.0 consultants specialized in LEAN management and Industry 4.0 solutions.

Planning

The last phase of the path is planning, where investment and project plans are detailed with the help of the consultant.

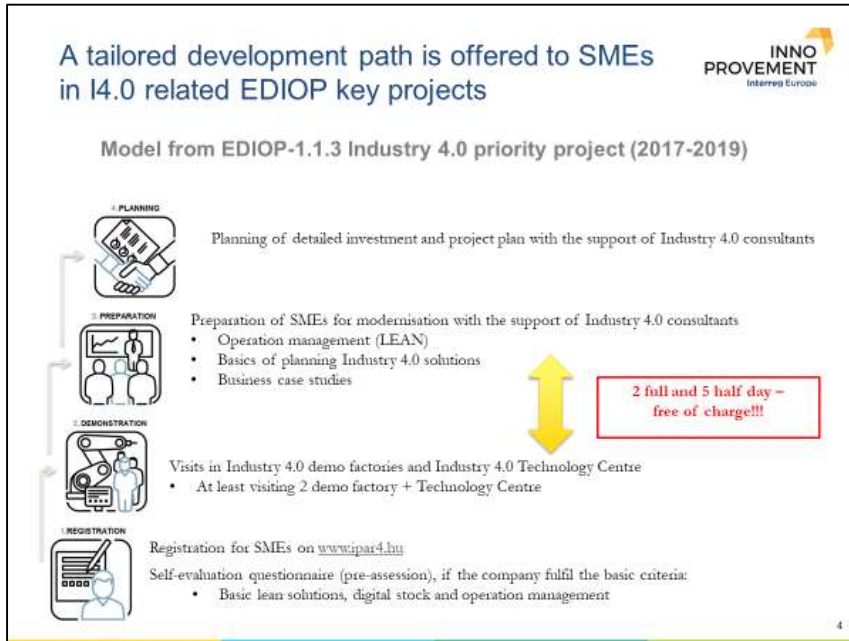


Figure 4: Key projects

3.2.2 Open Calls

In open calls the approach is different. There is not a specific path or a consultant for the SMEs, but there is a preferential treatment in counting the score in the application form where a company gets more points by using Industry 4.0 solutions.

Preferential treatment for I4.0 content in the project selection of open calls

INNO PROVEMENT Interreg Europe

EDIOP-1.2.1 – Technology development for SMEs

In the scoring sheet 10 points from 100 can be achieved if the applicant company uses I4.0 solutions

Application Industry 4.0 solutions	10
The applicant company does not use Industry 4.0 solutions	0
The applicant company uses management information system or will use it as a result of the current project	4
The applicant company uses production planning, production scheduling system or will use it as a result of the current project	7
The applicant company uses highly-automated intelligent production planning and management information system that is based on the analysis and processing of manufacturing data or will use it as a result of the current project	10

EDIOP-2.1.8 - Adaptive technology innovation for SMEs

In the scoring sheet 5 points from 100 can be achieved if the applicant company implements the project in a sector belonging to the Irinyi-plan (plan of reindustrialisation, including Industry 4.0)

- From 2737 winning project proposals 1491 projects belonged to the sectors of the Irinyi Plan (~54%)

5

Figure 5: Open Calls

3.2.3 Dedicated calls

Another type of call promoted by the Ministry of Economy is the EDIOP 1.2.8. The aim for this scale is focused on technology: i.e. “The development of technological systems, production and management systems for pre-qualified industrial SMEs”.

EDIOP-1.2.8 - Dedicated support for the development of SMEs for industrial digitalization (Industry 4.0)	
Aim of the call	Development of technological systems, production and management systems for pre-qualified industrial SMEs (Call under Thematic Objective 3 – SME Development)
Eligible applicants	SMEs with at least 20 employees and at least 0.63 m EUR annual revenue
Amount of subsidy / intensity rate	<ul style="list-style-type: none"> Total budget of the call: 20.5 m EUR Budget per project: 67 000 EUR – 1.7 m EUR; Intensity rate: max. 50% (depending on the region)
Supported main activities	<ul style="list-style-type: none"> Purchasing new machineries Developing automatic production system, Development of production technologies: process automation tools, development of sensor and control technologies using robotics Industrial cyber solutions, smart manufacturing, machine-to-machine, purchasing IoT solutions Licence, know-how, immaterial goods
Compulsory commitment from applicant	<ul style="list-style-type: none"> Growth of turnover or growth of operating profit

Figure 6: Dedicated Calls

3.2.4 Concluding remarks

Project proposals with Industry 4.0 content significantly first appeared in innovation calls in 2015-2016 in Hungary (EDIOP-2.1.1, EDIOP-2.1.7).

The phenomenon spread fast and as a result the calls tried to follow and favour I4.0 related projects in multiple ways (adjustments of calls in 2016-2017):

- Preferential treatment during the selection procedure in open calls
- Dedicated open calls for the purchase of Industry 4.0 equipments
- Key projects offering complex SMEs development path for digital transformation calls.

As a result of the above, many quick changes were done in calls. Therefore, the question came out naturally: are we, as Managing Authority, doing the right changes? → let’s see foreign experiences → submission of INNO PROVEMENT

INNO PROVEMENT contributed a lot in understanding how Industry 4.0 is supported in partner countries and what the relevant factors are, such as:

- Importance of awareness raising
- Significance of the human factor – less focus on technology, more on training and skills development
- Realising that Industry 4.0 is not a goal but a tool: First put the business model under investigation
- Good examples of the use of maturity assessments
- Importance of development paths offered to companies

3.3 Region of Thessaly (Greece)

3.3.1 Invest in Thessaly

The proposed call supported, newly established and start-up companies in using patents and/or innovations, support services for the improvement of their activities or for the development of new products and also created services.

The features of the call are:

- Budget per project: 50k€ - 400k€ (60% public fund or 70% in case of hiring of one employee);
- Total budget: 53M€
- Project duration: max 24 months;
- Submission period: from 09/17/2019 to 11/29/2019.

Eligible expenditures: Tangible and intangible assets such as construction, equipment, certification, ICT equipment and solutions, consulting services, participation in trade fairs, innovation aid (acquisition, transfer and use of know-how, intellectual property rights), new staff cost, operating costs.

The evaluation criteria:

The call required, for each project, at least 1 point to participate, with a maximum of 5.

Points were divided in:

- Utilization of patent: *2 points*
- Exploitation of Research results: *1 point*
- Use of product or service awarded on innovation/entrepreneurship competition: *1 point*
- Use of product or service participated on innovation/entrepreneurship competition: *1 point*

The results of the call are:

- Number of applications: 427
- Awarded projects: 373 (278 RIS related sector)
- Rates of projects 1-4 points: 14%, 40 out of 278
 - o 1 point: 32 projects
 - o 2 points: 5 projects
 - o 3 points: 2 projects
 - o 4 points: 1 project

3.3.2 Re-invest in Thessaly

The call supported existing companies for the utilization of patents and/or innovations, and also created support services for the improvement of their activities or for the development of new products and services.

The features of the call are:

- Budget per project: 80k€ - 400k€ (50% public fund or 60% in case of hiring of one employee);
- Total budget: 23,5M€
- Project duration: max 24 months;
- Submission period: from 05/16/2019 to 10/31/2019.

Eligible expenditures: Tangible and intangible assets such as construction, equipment, certification, ICT equipment and solutions, consulting services, participation in trade fairs, innovation aid (acquisition, transfer and use of know-how, intellectual property rights), new staff costs.

The evaluation criteria are:

The call required, for every project, at least 1 point to participate with a maximum of 3.

The results of the call are:

- Number of applications: 237
- Awarded projects: 210 (137 RIS related sector)
- Rates of projects up to 3 points: 10%, 14 out of 137
 - o 1 point: 7 projects
 - o 2 points: 4 projects
 - o 3 points: 3 projects

3.3.3 *Concluding remarks*

Regional calls directed to SMEs include criteria mainly focused on innovation and use of patents. The Directorate of the Development Programming is responsible for publish, evaluating, awarding and monitoring the implementation of the projects.

Thanks to the INNO PROVEMENT project experience, an increased ability of the regional administration has been noticed. For this reason, Marche Region's good practices will be taken into account during the design of the SMEs calls for the next programming period (I4.0 related projects).

3.4 Ministry of Industry and Trade of the Czech Republic

The aim of the measure is to increase the competitiveness of small and medium-sized companies by supporting the purchase and implementation of advanced non-manufacturing digital technologies to help and ensure a fundamental change in production process, or capacity expansion or increase production or offered services by supporting automation, interoperability, enhanced data processing and more efficient interconnection and management of business processes.

The current call is mainly dedicated to projects which are implementing Artificial Intelligence, process automation, robotics and cyber security off online and cyber-physical systems, in connection with the introduction of new technological knowledge (skills), including support for training and education of the employees linked to the introduction of new technologies in companies.

This new Call (of Ministry of Industry and Trade) is the first of its kind so the experience with its implementation will serve as an important source of data for future preparation of calls with much larger financial allocation.

3.4.1 Categories of support:

- Digital transformation
- Logistics and warehouse technologies (smart warehouses)
- Intra-company connectivity
- Cybersecurity

The call foresees a basic support for the purchase of regular office applications and basic HW up to a maximum of 20% of total eligible expenses.

3.4.2 Project Evaluation

The most important and unique part of the evaluation is the assessment of the percentage of budget items of newly acquired items and services falling into the category of "Digital Enterprise". The resulting % rate is equal to specified point scales. The opposite of "Digital enterprises" is represented by category of "Basic support", such as office and accounting software, which is limited by 20% of total eligible expenses.

Such an evaluation will consist in more reliable results. The complexity of the evaluation is simplified by using pre-filled out Excel sheets, which contains the example, including the automatic algorithms to calculate the result. Such pre-filled out sheet is the applicant and is also used to accurately document and evaluate the state of the expenses.

3.4.3 Support mode

Articles 14 and 18 of Commission Regulation (EU) No 651/2014, General Block Exemption Regulation Commission Regulation (EU) No 1407/2013 on *de minimis* has been applied.

3.4.4 Regional investment aid

Under the initial investment rules, one of these conditions must occur:

- an investment in tangible and intangible assets related to the setting-up of a new facility
- extension of the capacity of an existing facility
- diversification of the output of an establishment into products not previously produced in the facility
- a fundamental change in the overall production process of an existing facility

Expenses for online services and Cloud like SW are provided only under *de minimis* because they can not be supported under Article 14.

3.5 Kainuu Region

3.5.1 Description of the situation before and after INNO PROVEMENT

BEFORE

- From the policy instrument report: Industry 4.0 (I4.0) has not been part of the SF during the previous period 2014-2020.
- Policy focus has been on Artificial Intelligence (AI).
- Automation of public sector processes has been a priority; automation of commercial services in some industries like tourism has also been high.
- Automation of business and production processes has not been stressed sufficiently.
- Production of AI innovations has been in focus, including several projects in Kainuu.

AFTER

- Industry 4.0 in revised RIS3, transversal activity; stressing both the uptake of Industry 4.0 and the production of related innovations.
- Prioritised project pipeline has been approved by the Provincial Board on 03.09.2021.
- Adjustment of calls has not been discussed yet.

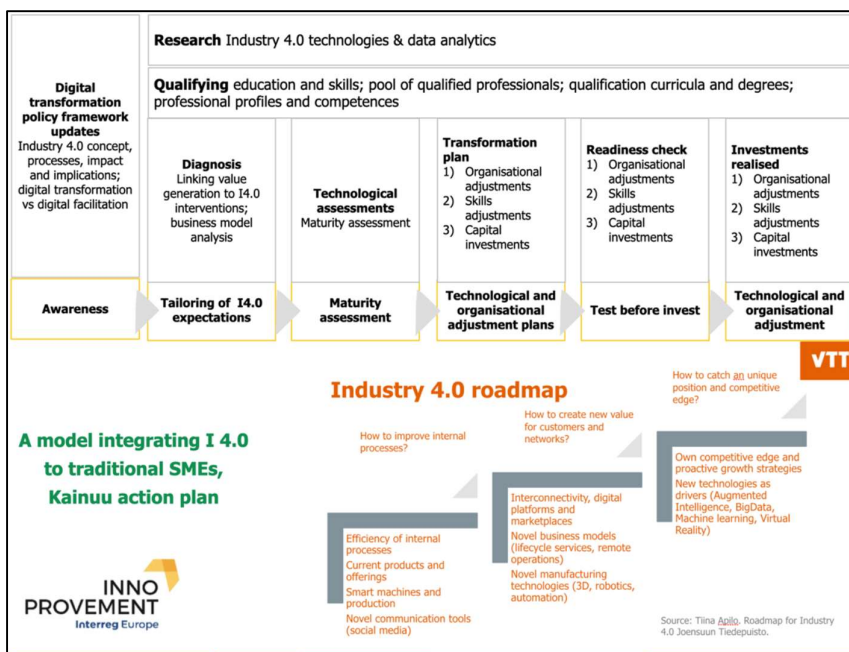


Figure 6: A model Integrating I4.0 To traditional SMEs

3.5.2 Approach

The starting point is the Thematic document 2 (Industry4.0 for traditional SMEs) and the Kainuu Action Plan, based on a model developed during the INNO PROVEMENT project. This model emphasises a process

approach, essentially linking value – formation analysis of business processes to digital transformation and to the enterprise’s willingness to invest. The expert explain that they need to combine knowledge intensiveness with technology uptake.

Reflections

- Finland hopes that one pilot action is approved together with PP1 and 2.
- Implementing the action plan’s approach poses the question on having holistic calls or having separate calls for the different parts of the model implementation.
- contributions on how to adopt Industry 4.0 are bringing more and more insights to be taken into account, already from the stage of the design of the calls, even if the answer is not simple yet

Factors to take into account are:

- **SECTORS MATTER**
Enterprises of particular industry sectors are currently at various levels of advancement of their work in the reorganization of production to a level of I 4.0. The development of enterprises towards Industry 4.0 requires rethinking the methods, processes, IT solutions and organisational forms used.
- **NEW SKILLS, ORGANISATIONAL ADJUSTMENT**
The implementation of the Industry 4.0 strategy requires new competences from employees. One of them is data collection and analysis, which includes knowledge in the areas of big data and machine learning.
- **NEW PROFESSIONAL FIELDS**
New competences and new specialists will also be needed in the areas related to data security, access control and information management. The changes affect many employee skills. New skills are a widely addressed topic in discussions among business practitioners, politicians, and academia
- **BACK UP ENVIRONMENTS**
Computer environments and cloud systems create a backup for further changes.

Reflections

To “get things right”, a McKinsey report (06.30.2021) recommends:

- Redesigning business processes to eliminate areas of value loss and take advantage of the system’s capabilities.
- Taking a broad view on value, focusing on benefits for both the overall business and the end users. This is especially important for intermediate goods.
- Integrating the new systems (the digitalised ones) with the organisation’s wider digital infrastructure.

CONTINUOUS RESEARCH on the ways of leading enterprises to implement Industry 4.0 is carried out in industry sectors, in-market segments, in clusters, in capital groups, and other formal structures

3.5.3 Concluding remarks

- The modelling seems to be right.
- There is a need to adjust calls criteria to include optimised solutions, and eventually the need to take into account sector-specific characteristics.
- There is a need to attach to the business transformation calls complementary skills development and organisational skills adjustments.



- There is a need to professionalise skills for system integration of digital transformation solutions based on segments (business process modules).
- There is a need to professionalise skills for data management.

3.6 Compete 2020 (Portugal)

The starting point of the Compete 2020 contribution is the good practice published on the INTERREG EUROPE website, “Evolving call requirements for Industry 4.0”.

The Portuguese contribution underlines the importance of building and creating environments where innovative ideas can connect and the importance of understanding the effectiveness of investments in I4.0. Adapt and evolve calls towards better I4.0 concept implementation, influencing SME’s to adopt new technologies, organization and management methods.”

- (...) evolving requirements in calls can influence positively the evolution and adaptation of SMEs.
- (...) setting requirements for SMEs to achieve the best classification for selection purposes, has a side effect, as projects are adapted to the new circumstances.
- (...) With each new Call, and each new revision of the requirements, the SMEs adapted and improved their projects to better respond to these requirements.

3.6.1 Application

- **Voucher I4.0 (2017)**

Specific call for I4.0

SME’s projects in order to diagnose their condition and needs to evolve

- **Innovation Qualification Calls (2017-2021)**

Included I4.0 concepts as factor of valuation for a project

- **I4.0 Referential (2021)**

High score for relevant investments

Higher incentive tax

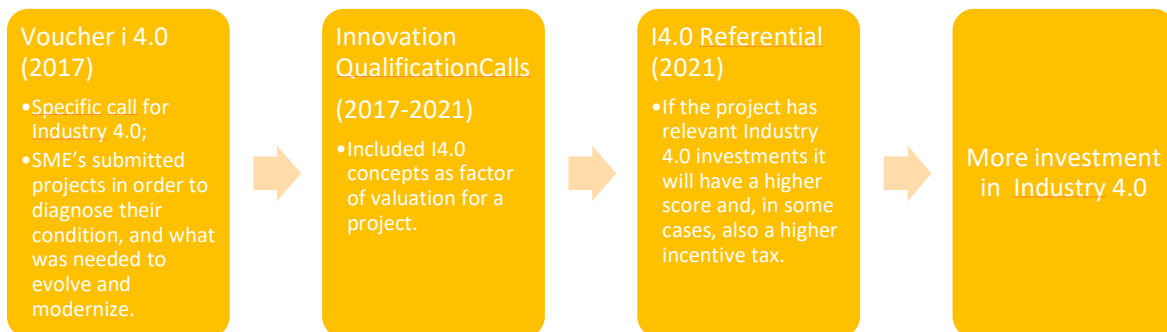


Figure 7: Application

3.6.2 Evolution

Most SMEs embrace Industry 4.0 as an opportunity but don't see Industry 4.0 as a natural evolution of their company. There is a continuous development of the enterprises: new and faster technologies allow SMEs to reach higher goals and see Industry 4.0 as a valid evolution not a difficult revolution.

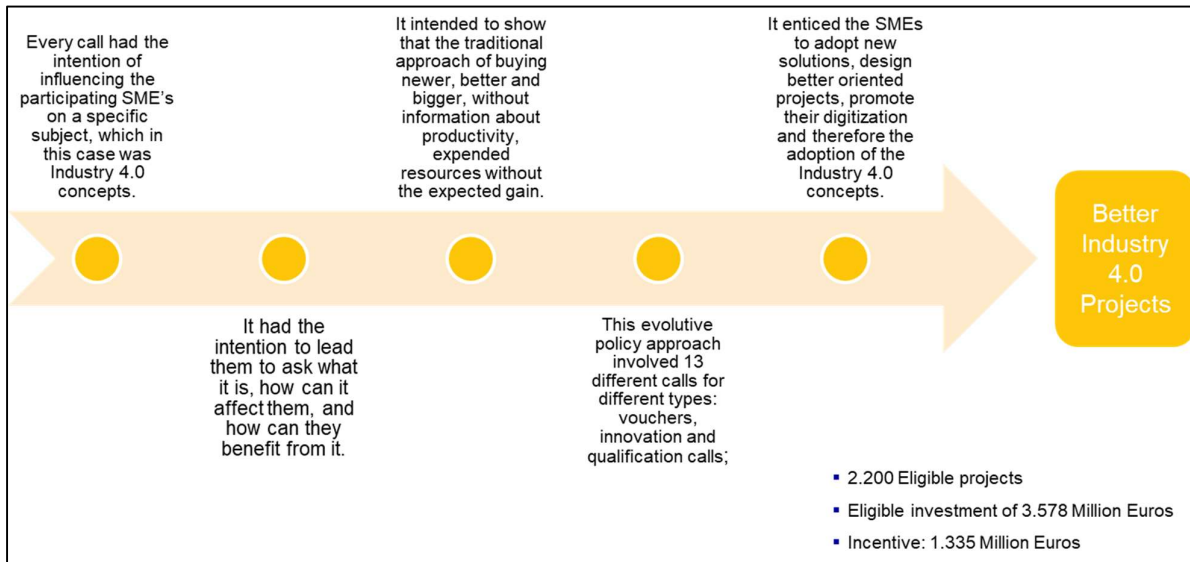


Figure 8: Evolution

3.7 Lodzkie Region

The contribution presents two areas of the Lodzkie Region Activities:

- Regional Action Plan
- Conclusions from the Industry 4.0 workshop – online regional stakeholder meeting

Action Plan

1. Inclusion of Industry 4.0 in the main area of support at the level of the **Lodzkie Region Development strategy 2030**
2. Introduction of references to Industry 4.0 to the **European Funds for Lodzkie 2027** (program replacing the Regional Operational Program)

3.7.1 Action 1

Inclusion of Industry 4.0 in the main area of support at the level of the **Lodzkie Region Development Strategy 2030** approved by the Self-Government of the Lodzkie Region on 6 May, 2021.

Industry 4.0 is mentioned as one of the **main development trends of regional economy**.

Industry 4.0 is the chance for SMEs of the Lodzkie Region to build a competitive advantage at national and international levels.

Operational at Objective in the Strategy is *supporting the reindustrialization of the region's economy, including the use of Industry 4.0 solutions [...]*

3.7.2 Action 2

Introduction of references to Industry 4.0 to the **European Funds for Lodzkie 2027**

The proposed action was developed based on the experience of the first phase of the INNO PROVEMENT project involving the exchange of experience and good practices between project partners.

The Lodzkie Region was inspired by the good practices presented by the partner from Portugal, COMPETE 2020:

- Industry 4.0 Referential
- Evolving call requirements for Industry 4.0

Priority: "Innovative Lodzkie" – specific objective is "Increasing growth and competitiveness of SMEs through production investments"

The support includes:

- transformation of business models of enterprises of the Lodzkie Region towards Industry 4.0 and data-driven economy
- the necessity to create professional consulting support.

Activities related to training and raising the level of knowledge of SMEs about digital transformation are crucial for the successful implementation of projects in this area.

3.7.3 Industry 4.0 workshops – 2 days long on-line regional stakeholders meeting



- 1st day–Industry 4.0 technologies
- 2nd day–Industry 4.0 business models

During the meetings, participants had the chance to measure the level of the digital evolution of their company and to have individual consultation with experts

Concluding remarks:

- Educating the staff related to digital transformation programs (Leader 4.0, Engineer 4.0)
- Educating entrepreneurs on the roadmap, transformation plan and digital transformation implementation plan
- Interaction with the business environment in the region (economic zones, clusters, competence centers)
- Direct support, i.e., appropriate directing of regional funds to those areas that fit into the Industry 4.0 ecosystem (start-ups, trainings, innovations)



4 Conclusions

The partnership of INNOPROVEMENT focused on the issue “Adjusting calls to I4.0 requirements” differently due to differences in addressing policy instruments. Some of the partners refer to central government programme, while some other partners work with regional or local programmes and other partners work with both of them.

The partners shared their regional experience about the issue, providing valuable contribution to this thematic subject.

From the contribution is clear that some partners work on Industry 4.0 related calls since the beginning of the dissemination of the theme I4.0, while other partners are facing the issue now with the INNO PROVERMENT project.

At the moment, there are two main types of call. The first ones, where SMEs are supported step by step to reach the implementation of industry 4.0 solutions. The second one presents evaluation systems, based on a scoring and conditions, matching systems access investment funds.