This project is funded by the European Union

TEBD TURKEY-EU BUSINESS DIALOGUE

DIGITALISATION OF INDUSTRY

Baseline Research

TEBD/043 – "TRANSFER OF BEST PRACTICES THROUGH STRUCTURAL DIALOGUE FOR CAPACITY DEVELOPMENT IN THE FIELDS OF DIGITALISATION AND INDUSTRY-UNIVERSITY COLLABORATION AND INTERNATIONALISATION"

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unioncamerelombardia

CIVIL SOCIETY SECTOR

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EXECUTIVE SUMMARY

TEBD/043 Project 15 – 18th September Italy Research Visit

Studies conducted in Lombardy (Italy) on the digital transformation and industry-industry collaborations were aimed to be examined on the field and for this reason a 3-day research visit was organized.

- Lombardy is the most developed industrial region of Italy and carries out 27.4% (117 million Euros) of the industrial export.
- "Impresa 4.0" economic development program, it is aimed to increase the awareness of companies on 9 different Industry 4.0 technologies and to facilitate the investment and adaptation. In line with this aim, since 2017 the Italian Ministry of Economic Development has created 3 main structures: Punti Impresa Digitale (PID), Digital Innovation Hubs (DIH), Competence Centers (CC).
- In Lombardy, a digital experience center has been established.
- With Open Innovation Platform of Regione Lombardia, the collaboration between public, private sector, academy and civil society is aimed to be increased.
- Relight (member of AFIL - Lombardy Cluster for the Advanced Manufacturing) ensures that electronic waste is recycled into raw material by recycling electronic devices and then regaining it into the economy.

Situation in EU and other countries

Digital transformation studies and investments are ongoing in the European Union and other countries. Many EU countries have created their digital transformation strategies under "Industry 4.0" and make investments accordingly. Governments and organizations create good application examples within the framework of digital transformation.

Digital Transformation Scores of countries

According to the report prepared by the European Commission, it emerges that several Scandinavian and Western European countries have been on the top in terms of Digital

Technologies Integration Index (DTII) and Digital Transformation Enablers' Index (DTEI). According to the digital performances and competitiveness scores of the European Union countries, Finland, Sweden, the Netherlands and Denmark are the leading countries in the digitalization process.

TEBD/043 PROJECT 15 – 18TH SEPTEMBER ITALY RESEARCH VISIT PROGRAM

Participation in the following program was provided in the Italy research visit with a view at examining on the field the researches conducted in Lombardy (Italy) and industry-university collaborations.

16th September, Monday

Visit to Unioncamere Lombardia and presentations of related organizations

- Opening remarks - **Roberto Valente** (Head of SMEs Policy Unit - Unioncamere Lombardia)
- Overview on Lombardy and Industry-University collaboration in the region - **Samuel Nazzareno Monaco** (Internationalisation and Innovation Expert - Unioncamere Lombardia)
- The role of the Italian (and Lombardy) Chamber System for the digitalisation of mSMEs - **Flavio Pagnoncelli** (Innovation Expert - Unioncamere Lombardia)
- The activities of Innovhub in the context of innovation & technology transfer and an overview on AFIL (Lombardy Cluster for the Advanced Manufacturing) - **Ilaria Bonetti** (Head of Innovation and Projects Area - Innovhub - Special Agency of the Chamber of Commerce of Milan, MonzaBrianza and Lodi)
- The role of the digital promoter within the "Impresa 4.0 Plan" - **Francesco Sisca** (Digital promoter - Punto Impresa Digitale of the Chamber of Commerce of Milan, MonzaBrianza and Lodi)

- Best practices and innovative services offered by the Chamber of Commerce of Milan, MonzaBrianza and Lodi - **Sonia Basso** (Head of Innovation and Credit Unit - Chamber of Commerce of Milan, MonzaBrianza and Lodi)
- Open Innovation Platform of Regione Lombardia: a tool to support the creation of innovation ecosystems - **Angelo Gatto** (Senior Innovation Expert - Finlombarda)
- The S3Lab on Emerging Industries and the Regional Technology Clusters in Lombardy - **Marco Baccan** (Senior Innovation Expert - Finlombarda)
- Ecosistema Innovazione Lecco: a pilot project aiming to foster knowledge transfer between mSMEs and research organizations - **Mariella Guzzi** (Project Officer - Regione Lombardia)
- Best practices from Lombardy Region in the field of internationalisation - **Jessica Spezzano** (Project Officer - Regione Lombardia)
- Chamber System's activities and best practices in the field of internationalisation - **Valeria Centinaro** (Head of International Projects Unit - PROMOS Italia - Special Agency for the promotion of international activities)

17th September, Tuesday

Bergamo Sviluppo Point and Incubation Center Visit

- Presentation of Bergamo Sviluppo (Special Agency of the Chamber of Commerce of Bergamo) and POINT (Bergamo Science Park) - **Cristiano Arrigoni** (Director - Bergamo Sviluppo)
- Presentation of the Business Incubator: objectives and target - **Paolo Carminati** (Project Manager - Business Incubator of Bergamo Sviluppo)
- Visit to the Experience Center of Bergamo Sviluppo and to 3 start-ups of the Business Incubator and POINT

18th September, Wednesday

- Fintech District on-site visit
- Visit to Relight, AFIL member

ABOUT LOMBARDY REGION AND UNIONCAMERE LOMBARDIA

With a population for 10 million and 12 provinces Lombardy is the most developed industrial region of Italy and carries out 27.4% (117 million Euros) of the industrial export (according to data from 2017).

Provinces constituting Lombardy Region

Population (2017)	10.036.258
Area	23.863,65 Km²
Active companies (2017)	815.956
Manufacturing companies (2017)	96.072
GDP (2017)	366.541 MEUR *(21,8% of Italy)*
GDP per capita (2017)	37.258 EUR
Export of manufactured products (2017)	117.882 MEUR *(27,4% of Italy)*

Important data on Lombardy Region

Unioncamere Lombardia (Regional Union of the Chambers of Commerce, Industry, Agriculture and Crafts of Lombardy) has been a member of Enterprise Europe Network since 2015 and takes an active role in the projects of European Union. Around 800,000 companies, whose membership in the Italian Business Register is compulsory, are supported by 9 local Chambers of Commerce.

The organization focuses on 6 main fields.

- internationalisation
- digitalisation and Industry 4.0
- promotion of the territory
- economic information for local development
- competitiveness of small and medium-sized enterprises
- representation, coordination and assistance to the Chambers of Commerce

GOOD EXAMPLES OF INDUSTRY-UNIVERSITY COLLABORATION IN LOMBARDY REGION

Several good examples presented during the research visit in Italy are the following:

- AFIL (Lombardy Cluster for the Advanced Manufacturing)
- Speed MI Up
- Open Innovation Platform of Regione Lombardia
- S3Lab on Emerging Industries
- Regional Technology Clusters in Lombardy
- POINT and Business Incubator of Bergamo Sviluppo
- Ecosistema Innovazione Lecco
- ComoNext Incubator and Digital Innovation Hub

LOMBARDIA POINT (SERVIZIONLINE.LOMBARDIAPOINT.IT)

Member firms can access this online service provided by Unioncamere Lombardia and get free advice and assistance from the specialists. The main subjects of advice are:

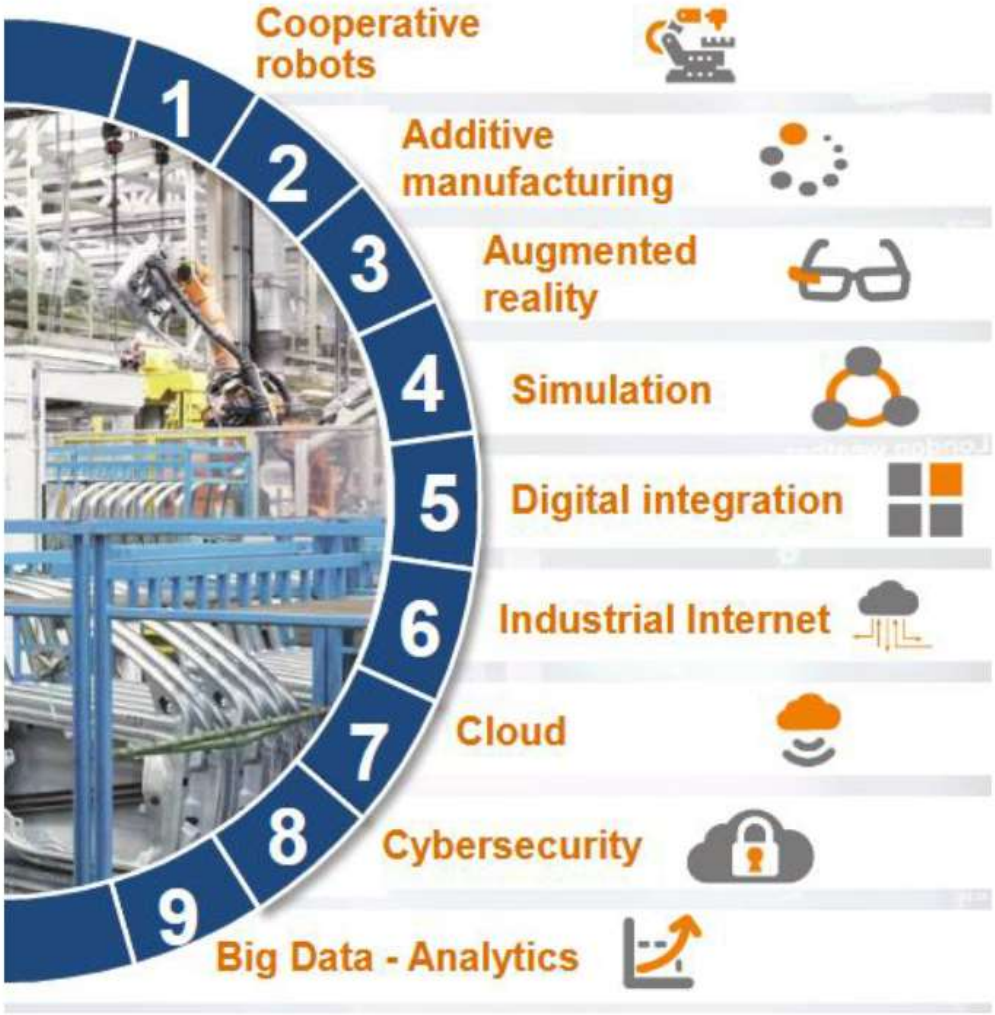
- European Union legislation
- patent and trademarks
- international contracts
- international taxation
- international marketing

Companies have access to the specialists' database from a single point and receive the support they need swiftly thanks to this solution. Questions made by the SMEs and their answers will be recorded and made available digitally.

ITALIAN (AND LOMBARDY) CHAMBER SYSTEM FOR THE DIGITALISATION OF SMES

The instruments of "Impresa 4.0" economy development program developed by the Italian Ministry of Economic Development in 2017 aim to increase awareness of companies on Industry 4.0, detect digital maturities and investment fields, facilitate the adaptation of technologies and to support the companies with the researches in industrial technologies.

Within this scope, the following technologies are based on:



Industry 4.0 technologies

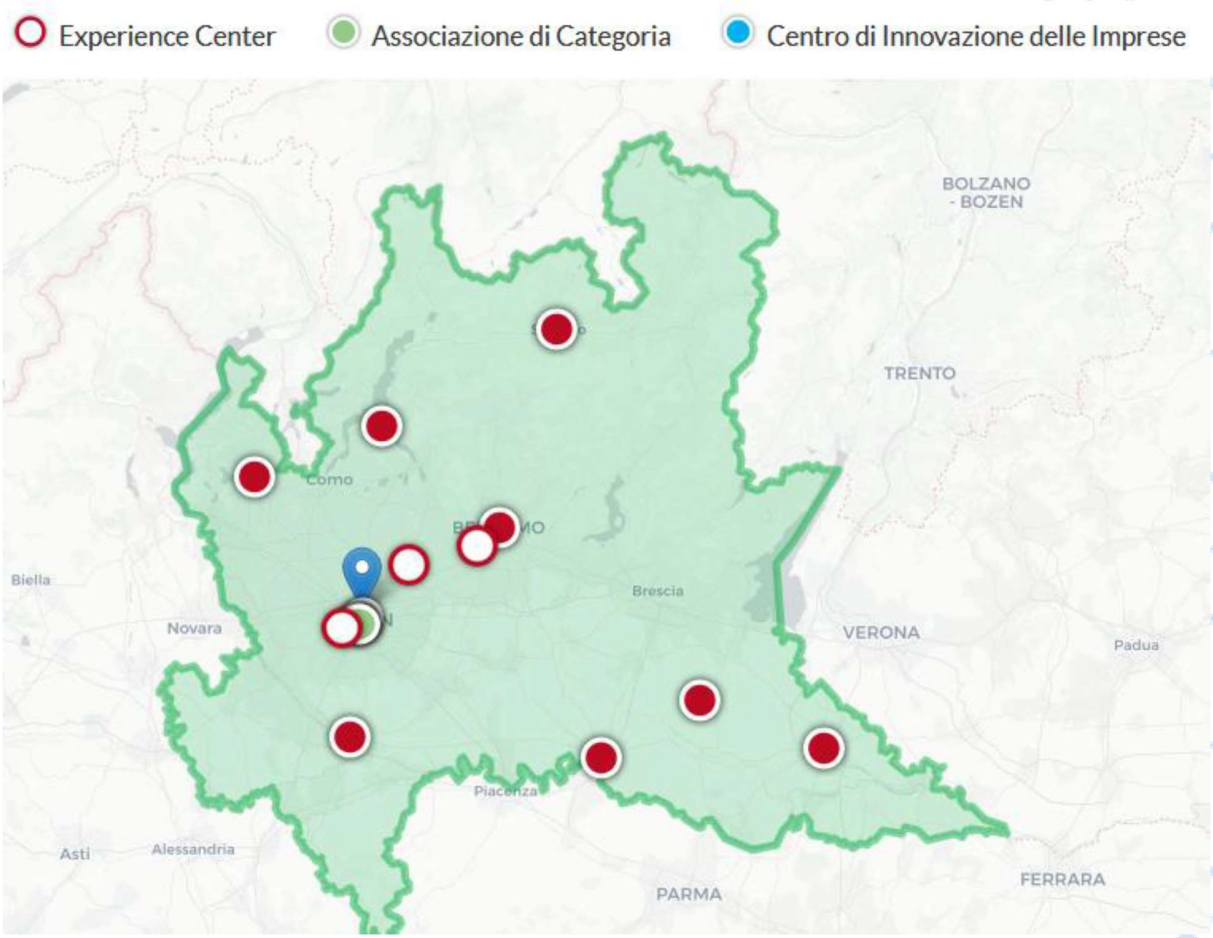
In line with this aim, the Italian Ministry of Economic Development has created 3 main structures:

- **PID (Punti Impresa Digitale):** located in each local Chamber of Commerce, they aim at fostering and increasing awareness on Industry 4.0 technologies and realization of information share;
- **DIH (Digital Innovation Hubs):** supported by business associations, they aim to provide advanced trainings on technologies, to support digital transformation and technology transfer processes;
- **CC (Competence Centers):** academic centers supporting the advanced technological research and development studies.

Duties and obligations of each structure have been fully determined and industrial organizations provide support for their digital transformation studies and adaptation of Industry 4.0 technologies. In this way, companies have a clear route map regarding the organizations they will meet and the phases they will go through in this period. For example, PID conducts awareness training, which is the first stage, and basic digital maturity assessment for industrial companies which have digital transformation agenda.

PID supports the first stage studies with 2 different services:

- SELFI 4.0: digital maturity assessment study that firms can conduct by themselves in 30 minutes;
- ZOOM 4.0: detection of the focuses of firms by 2-hour meeting and survey study by being visited by a digital specialist (who also provides services as digital mentor). As an output of this study, analysis and report are shared with the company. According to the projects detected for the following steps, they are directed to DIH and/or CC.



PIDs (red points) and Industry 4.0 experience centers (white points)

The Digital Experience Center platform created in Lombardy provides services in the following areas:

- information and opinion share between the stakeholders
- project suggestion share
- news and activity share regarding the subject in the region
- information, experience and report share regarding the studies conducted by organizations in Industry 4.0

Unioncamere Lombardia provides financial assistance and regularly supports the implementation of Industry 4.0 applications for SMEs in certain sectors or with themes (i.e. recycling economy, e-Commerce, etc.) in fields like digitalisation, technology transfer and the creation of new products with innovation.

INNOVATION, TECHNOLOGY TRANSFER AND AFIL (LOMBARDY CLUSTER FOR THE ADVANCED MANUFACTURING)

Innovhub - Stazioni Sperimentali per l'Industria is the Special Agency of the Chamber of Commerce of Milan MonzaBrianza and Lodi with the following purposes:

- conducting the industrial research projects
- providing technical consultancy in particular subjects
- performing industrial tests for the firms
- process and product innovation
- determination of sectoral standards
- innovation support and information share
- education

It provides support to companies in advanced industrial tests with laboratories specialized in paper, fuel, silk and industrial oils.

Besides, Innovhub is among the founding members of AFIL (Lombardy Cluster for the Advanced Manufacturing). The cluster consists of 130 members, which include firms, universities and public research institutions. The purpose of the cluster is to create the best applications in production processes, technologies and innovation, and to distribute the knowledge among the members.

AFIL provides the following contribution to its members:

- Web platform enabling the members' knowledge and experience share
- Lombardy Production Route Map created for the first time in 2014 and regularly updated
- Theme-based study groups (layered printer, recycling production, digital and smart factory, etc.)
- Projects of members to be realized in collaboration

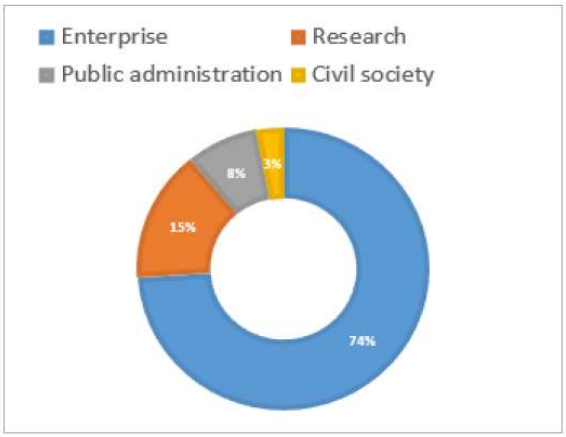
OPEN INNOVATİON PLATFORM OF REGİONE LOMBARDİA (WWW.OPENİNNOVATİON.REGİONE.LOMBARDİA.İT)

With this platform developed and provided by Regione Lombardia, the collaboration between public, private sector, academy and civil society is aimed to be increased.

Civil researchers such as universities, academies and institutions and citizens can also be actively involved in projects on the platform.

Digital tools that support activities such as information sharing, discussion groups, idea generation, project proposal, project management, application/participation to projects are provided under the platform.

Platform participants can create their own profiles and monitor the feedbacks for their projects. Many researches can be accessed by the organizations by crowd sourcing.



USERS	ORGANISATIONS	DISCUSSIONS
+ 10.000	+ 2.200	+ 1.800
COMMUNITIES	**PROJECTS**	**OPPORTUNITIES**
+ 400	+ 200	+ 600

Data on the use of Open Innovation Platform of Regione Lombardia

INTERNATIONALISATION SERVICES

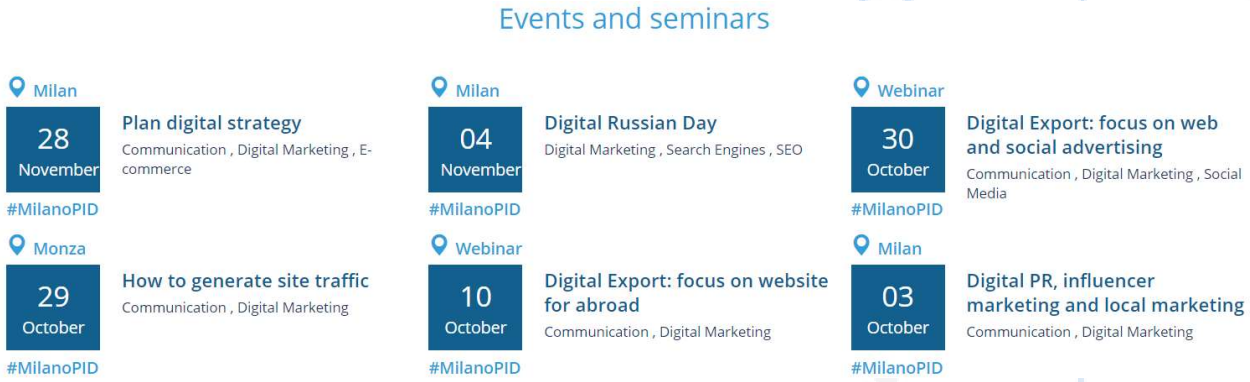
Promos Italia has been established with the aim to support minor and medium-scaled Italian firms in foreign markets. The agency provides information regarding the target markets and support in report, market research, digital product export, detection of foreign investments and representation in international fairs. Ready2go, the EU pilot project (www.b2match.eu/ready2go) is conducted within this objective.

Data on Ready2Go project

DigitExport (digitexport.it) platform includes services aimed at supporting the digital products of SMEs, such as:

- information share (article, video, etc.)
- digital applications for the detection of target markets for B2B and B2B products
- education and activities
- supplementary services (representation in international digital markets, online advertising support, etc.)

SMEs can get the chance of detecting the markets for which they can position their digital products through DigiExport. The platform provides market information regarding 223 sectors for 153 countries.



Examples from trainings organized by DigiExport

POINT AND BUSINESS INCUBATOR OF BERGAMO SVILUPPO

POINT (Polo per l'innovazione tecnologica della provincia di Bergamo) and the Business Incubator are located in Dalmine and are managed by Bergamo Sviluppo (Special Agency of the Chamber of Commerce of Bergamo). POINT was established in 1996 with the aim of technology development. Its main priority is to provide laboratory support for SMEs and to improve industry-university collaboration. Its budget is provided by Dalmine Municipality and Chamber of Commerce of Bergamo.

Specialists in POINT and the Business Incubator provide free services to SMEs in different points (i.e. acquisition of intellectual property rights, marketing, taxation, etc.). Additionally, they provide office field.

They provide service for 3 years for the firms and 6 years for production firms. 6-7 applications are received annually. Firms can perform commercial activities during the incubation process.

POINT represents the firms in incubation process by taking part in the international fairs.

VISIT TO RELIGHT FIRM, AFIL MEMBER (WWW.RELIGHTITALIA.IT)

Relight is a member of AFIL (Lombardy Cluster for the Advanced Manufacturing) and ensures that electronic waste is recycled into raw material by recycling electronic devices and then regaining it into the economy.

During the visit, information on the recycling processes in Italy was provided. Participants had the chance to witness the recycling processes during the visit of factory field. Occupational safety applications are closely followed in the factory where the majority of the processes are performed manually.

ASSESSMENT

- The 2-hour digital maturity assessment study conducted by PID for the firms are realized as survey method. It is thought that not conducting field visits and meetings on particular subjects on this stage might cause misunderstandings and time loss in the analysis of subjects specified by the firm and matching the correct solution and technology suppliers.
- With the support provided by Unioncamere Lombardia to SMEs in finance of digital transformation process, it is foreseen to be useful for the creation of sectoral reference projects and the creation of Industry 4.0 knowledge and economy in the region.
- Duties and obligations of Innovhub intersects with DIH and CCs.
- AFIL (Lombardy Cluster for the Advanced Manufacturing) is deemed as a useful instrument for firms with urgent agenda to come together and provide information share in terms of Industry 4.0. Including the active firms into this cluster will enable each member to provide value creation within the cluster.
- Open Innovation Platform of Regione Lombardia is a useful application not only for the organizations but also for the inclusion of citizens working personally into the projects.
- Internationalisation services for the export of digital products are considered to be beneficial for recovering the knowledge and experience deficiencies of minor-scaled businesses and facilitating the process of access to the international markets.
- Firms' accessing to the data of Market researches for their products by DigiExport will have a positive reflection on the planning of SMEs to expand abroad and will increase the efficiency of the limited resources.

CURRENT SITUATION IN EU AND OTHER COUNTRIES

Digital transformation studies are ongoing in European Union countries and other leading countries. Digitalisation of industry and other sectors is realized by governmental strategies. Countries support the digital transformation process by using different financing mechanisms. As seen in Figure 8, various models have been created so that practical R&D operations can be supported by the public in addition to the fundamental R&D in terms of digital technologies in the majority of country examples.

Figure 8: Country examples on digitalisation policy applications [10]

If we explain the examples in Figure 8;

- The European Commission makes investment for 500 million Euros for "Digitalised European Industry" initiative, digital innovation centers within the scope of Horizon 2020.
- The "Factories of the Future" initiative is a significant public-private partnership initiative with a budget of 1.5 billion Euros.
- Within the scope of studies conducted under "Smart Industry" in the Netherlands, innovation centers called as Field Labs have a key role. The Smart Industry strategy of the Netherlands attaches special importance to regional/local innovation ecosystems.
- Germany takes place among the leading countries in manufacturing industry and digital transformation and published its "2025 Digital Strategy". "10 Steps for the Future" have been specified in this strategy document.
- It is stated that more than 1 billion Pounds of public investment will be made until 2023 to develop digital infrastructure in the UK.
- Within the scope of digital transformation, national programs conducted in the Europe might be listed as follows: (Figure 9)

Industry 4.0 (**Germany**), MADE – Manufacturing Academy of Denmark (**Denmark**), Smart Industry (**Sweden**), Industry 4.0 (**Czech Republic**), Industry 4.0 National Technology Program (**Hungary**), Industry 4.0 (**Austria**), Industry Plan 4.0 (**Italy**), Industry 4.0 (**Portugal**), Subsidiary Industry 4.0 (**Spain**), Future's Industry Union (**France**), Made Different (**Belgium**), Smart Industry (**the Netherlands**)

Figure 9: European Digital Transformation National Programs [11]

The European Commission will be digitally transformed, user-centered and data-driven administration by 2022. It will be equipped with new generation, reliable and customized digital solutions that support the digitalised policies, operations and administrative processes. These solutions will increase the efficiency, activity, transparency and reliability of the European Commission and provide limitless digital public services within the scope of EU which is irreplaceable for the operation of European Union. [12]

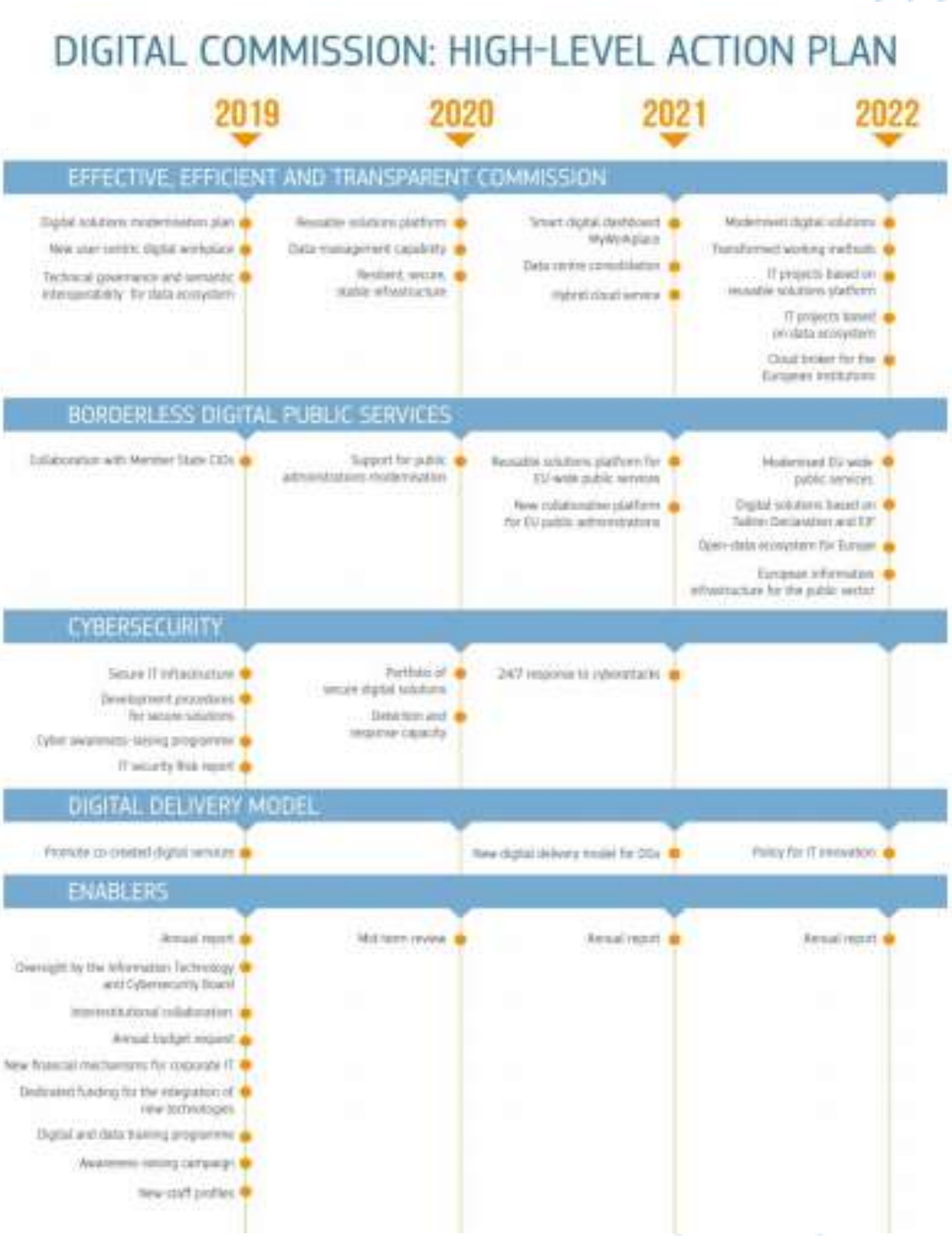


Figure 10: European Commission Digital Action Plan

EUROPEAN BEST APPLICATION EXAMPLES

- Bosch is working on a production flow where machines and products are communicate. By the pilot project tested in Bosch factory in Hamburg, it is aimed for the product to speak the same communication language spoken by the machine that produces it and the human factor that traces it. Smart production line makes decision and takes actions based on the received product type. Parts of different products can be processed in the same line while it is ensured that the products are open for new developments and get modularity. Data created in this complex communication network is simultaneously sent to the screens of employees who are carrying out the tracing operation.
- Road works and car parks will be traced and optimized and then a data producing transportation network will be created with the "Smart City" project. Smart City, a mobile application example for Industry 4.0 will be firstly used for Monaco.
- Smart Industry enterprise of the Netherlands attaches importance to distribute the digital technology and recover ICT conditions by benefiting from the current strong aspects in ICT infrastructure of the Netherlands. Totally 10 field laboratories were established together with the multi-stakeholder practical platforms in order to design, test and distribute technological solutions. Besides, companies are provided with technological and market insight including training and special tools.
- Industry 4.0 initiated in Germany in 2011 was designed and applied for the industrial collaboration by the German government at the first place. It was managed by strategy development and funding by the German Ministry of Education and Research and German Ministry of Finance; however, practical application was managed by the actors of the industry. Industry-focused Board of Directors has undertook the responsibility of the strategy development while the Scientific Consultation Board gives advices regarding the scientific subjects and the program. [13]

DIGITAL TRANSFORMATION SCORES OF COUNTRIES

Digital Transformation Score Table is a part of Digital Transformation Monitor (DTM). Digital Transformation Monitor (DTM) aims to promote digital transformation, follow new trends and provide digital transformation statics.

According to the report prepared by the European Commission, Digital Technologies Integration Index (DTII) and Digital Transformation Enablers' Index (DTEI) have been put forward. (Figure 16).

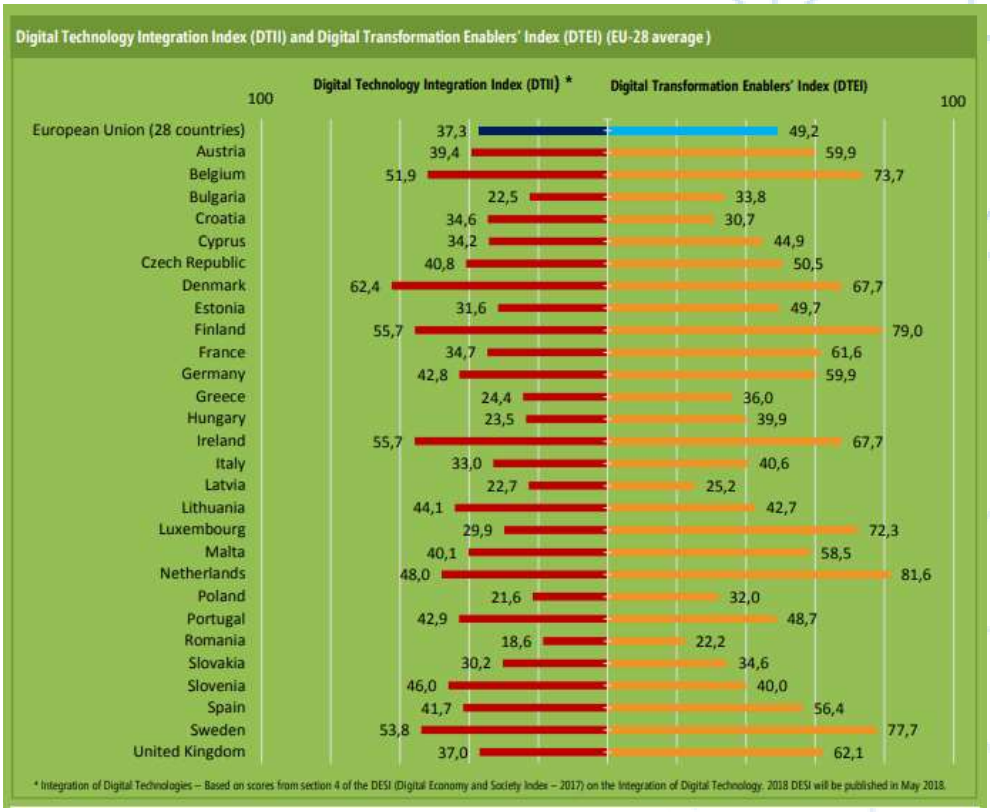


Figure 16: EU-28 DTII and DTEI [20]

According to the report, it is observed that Scandinavian countries and Western European countries are at the top in both indexes. The Netherlands, Finland, Sweden, Belgium and Luxembourg are the leading countries in DTEI scores. In DTII scores, Denmark, Finland and Ireland stand out as the largest economies.

Figure 17 shows the supply and demand relation of the digital transformation integrations of the European countries. If we compare the 2017 and 2018, we can say that the education is on rise and accordingly the digital competency capacity of the countries has been accelerated. Also, a positive relationship is observed between the supply and demand for digital skills and digital technology integration. Countries that put forward the best performance in the integration such as the Netherlands, Finland, Sweden take place in the top points of supply-demand curve.

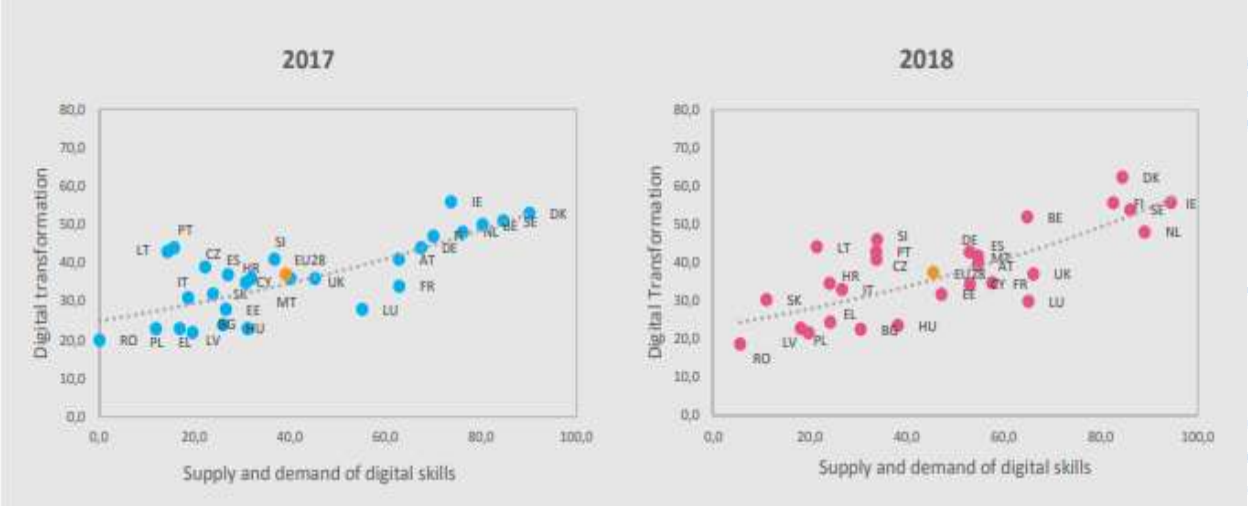


Figure 17: Supply-Demand Curve of Digital Competencies [21]

In the annual report of the European Commission (EC), the positions where European Union countries are standing in terms of their digital performances and digital competition are specified. Figure 18 shows the DESI 2019 ranking. While scoring, 5 different factors are taken into consideration: Connectivity, Human Capital, Internet Services Usage, Digital Technology Integration and Digital Public Services.

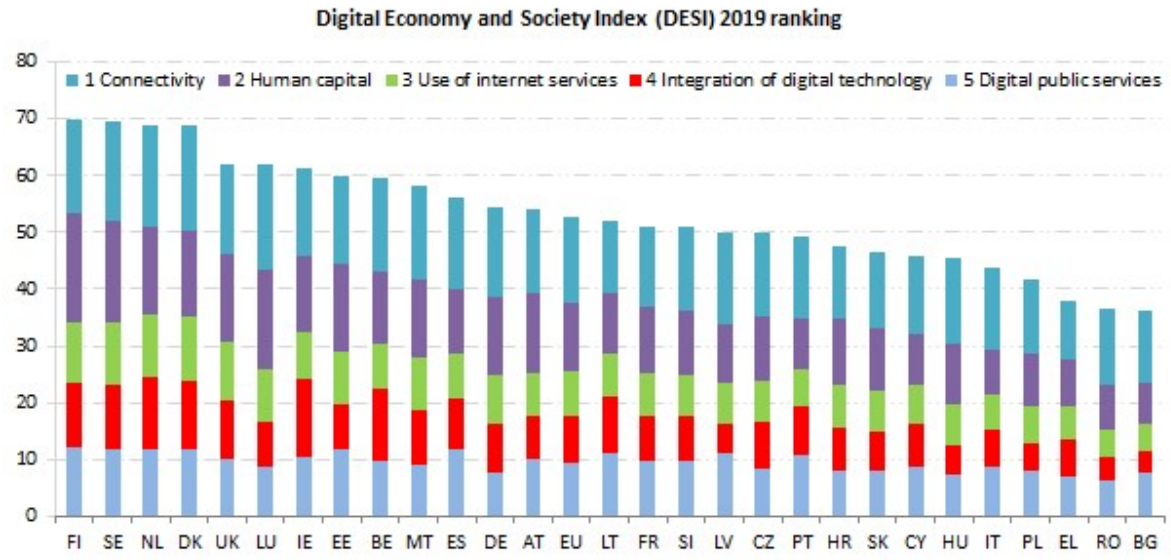


Figure 18: Digital Economy and Society Index (DESI) 2019 [22]

When the graphic is taken into consideration, Finland, Sweden, the Netherlands and Denmark are coming to the forefront in the index. These countries are followed by England, Luxembourg and Ireland in the digitalisation route.

RESULTS

In the European Union countries, digital transformation and Industry 4.0 studies are ongoing and closely followed by the assessment reports published by the European Commission. The European Commission constantly increasing their digitalisation scores in each year within the scope of "Horizon 2020" and through the strategies, national programs (The Netherlands Smart Industry), Germany Industry 4.0, Italy Industry Plan 4.0 Italy, etc.) that they have specified with the member countries, and public-private incentives, industry-university collaboration, R&D centers that they have established and significant amount of budgets that they prepared. In this process, European countries like Finland, Sweden, the Netherlands, Denmark ranked at the top. Turkey has become candidate for being model country in Industry 40 with the step it has taken accordingly.

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