

**MONITORING PROGRESS IN NATIONAL INITIATIVES  
ON DIGITISING INDUSTRY**

**Country report**

*Poland*

*July 2019*



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## Summary

Poland is steadily progressing since 2014, in line with the overall EU-28 Digital Economy and Social Index (2018) evolution results. The main strengths include a high number of STEM graduates (above the EU average) and a notable improvement in broadband coverage. On the other hand, some of the most pressing points are the shortage of basic digital skills in the population and the low number of the experienced ICT specialists. Overall, Poland currently belongs to the low-performing cluster of countries in terms of digitalisation and ranks 24th out of 28 EU Member States according to DESI Index (2018), with no change in rank compared to the previous year. Although there is an improvement in ranking (Connectivity, Human Capital) and score (the Use of Internet, Integration of Digital Technology), within most of the sub-indicators, they tend to remain below the EU-average.

Poland experienced one of the EU highest real GDP growths in 2017. Domestic demand in 2016 and 2017 remained the main driver of growth, while there was a slowdown in the number of investments during that period. The current national strategies addressing the digitalising of the industry have been developed through the creation of the Polish smart specialisation strategy within the Responsible Development Programme (horizontal strategy) and providing support to R&D within the Smart Growth Programme (National Work Programme). Several flagship projects were set-up focusing on 'reindustrialisation' and using innovation technologies. The new national strategy Future Industry Platform will define the future direction of Polish 4.0 Industry and should become operational in the first quarter of 2019. It is expected to be a key driver for changes in Poland towards digitalisation in the coming years. At least EUR 1.26 billion have been made available since 2016 across the national strategies and the initiatives under the different pillars of the Digitising European Industry (DEI) initiative and support mechanisms.

Within Pillar 1, Poland actively cooperates with the ICT Innovation for Manufacturing SMEs (I4MS) through innovation centres located in various cities in the country. Poland has recently launched some initiatives within Pillars 2 & 3 of the DEI with the main focus on adopting new technologies and increasing the use of innovation, for a budget of at least EUR 0.7 billion since 2016. Within the 'From Paper to Digital Poland' programme, the centralised AI strategy and the monitoring activity of the state of IoT in Poland will be developed. The 'Start in Poland' Programme creates favourable conditions for start-ups locating their business in Poland and is supported by the PFR Ventures, the largest Venture Capital investment platform in Central and Eastern Europe, a support mechanism with a funding of around EUR 0.5 billion since 2017. Also, several Competence Centres have recently become active, with a full launch planned for 2019. New regulatory updates were also implemented last year supporting R&D, entrepreneurship and more flexible processes for businesses and start-ups (Pillar 4). Additionally, the implementation of the EU NIS Directive is an important step towards preparing the Polish regulatory framework for the digital age. The recently launched initiatives within Pillar 5 incorporate within the education system certain programmes with the objective to increase digital skills of the Polish population and train students towards professions such as ICT specialists. Through the implementation of the Operational Programme Digital Poland 2014-2020 the digital skills shortages identified within Pillar 5 are expected to be addressed. Since 2017 at least ER 58 million has been allocated for the initiatives within this Pillar.

Table 1 below presents an overview of the main initiatives identified in Poland that will be further detailed in this report. Table 2 presents a short SWOT analysis of the Polish economy on digitalisation.

**Table 1: Overview of initiatives**

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
Responsible Development Strategy	2017	Overall strategy	Horizontal strategy	All	All	All	Total public funds, incl. EU EFSI funding and other EU: around 350 billion EUR. Total private funds: around 167.5 billion EUR
Smart Growth (PO IR)	2014	Overall strategy	National Work Programme	All	All	All	Total budget around 10.2 billion EUR (around 8.6 billion from ERDF fund)
Future Industry Platform	2019	Overall strategy	Horizontal strategy	All	IoT, Cyber Security, Robotics and Automation Machinery, Big Data and Data Analytics, 3D-Printing, AI	All	Around 15 million EUR budgeted for 2019-2021 (public and private funding)
From Paper to Digital Poland	2016	Pillar 2 &3	Digital platform for e-government services	All	All	All	N/A
Start in Poland	2016	Pillar 3	Ecosystem for start-ups	All	All	SMEs and start-ups	Around 0.7 billion EUR
Polish Industry 4.0 – support for DIH	Official launch 2019 (Q2)	Pillar 2	Support program for Digital Innovation Hubs	All	IoT, Cyber Security, Robotics and Automation Machinery, Big Data	SMEs	Planned budget around 15 million EUR (2019-2021)

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
					and Data Analytics, 3D-Printing, AI		
The Constitution of Business	2018	Pillar 4	Package of laws supporting businesses	All	N/A	All	N/A
Innovation Act	2017 & 2018	Pillar 4	Tax incentives and R&D support for businesses	All	N/A	SMEs and start-ups	N/A
National Cybersecurity System	2018	Pillar 4	IT security regulation	Cybersecurity	N/A	N/A	N/A
Training activities for the development of digital competences	2017	Pillar 5	Educational Training	All	All	Schools & universities	23 million EUR
The broad alliance on digital skills	2013	Pillar 5	Industry Alliance	All	All	N/A	N/A
'Technician – programmer' programme	2018	Pillar 5	Education Programme	ICT sectors	All	Schools	N/A
Innovative solutions for digital activation	2018	Pillar 5	Educational Training	Education	All	Schools	About 35 million EUR within Programme Digital Poland 2014-2020 (EU funding ERDF)

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
PFR Ventures	2016	Supporting mechanism	VC	All	All	SMEs and start-ups	Around 0.5 billion EUR since 2017 to date
Vouchers for innovations for SMEs	2014	Supporting mechanism	Innovation Vouchers	All	All	SMEs	Around EUR 1.2 million (2014 to 2020)

**Table 2: SWOT of the country on digitalisation**

<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• Number of STEM graduates above the EU average</li> <li>• Notable improvement in broadband coverage</li> <li>• Growing network of DIH and Competence Centres.</li> <li>• National work programme providing financing to supporting R&amp;D</li> </ul>	<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>• The percentage of the ICT specialists below the EU average and lack of experienced ICT specialists</li> <li>• Over half of the adult population is still lacking at least basic digital skills.</li> </ul>
<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• Future Industry Platform (4.0) to be launched in 2019 expected to create opportunities within the Industry 4.0.</li> <li>• Commitment from the Ministry in charge to bring innovation to the Polish economy and entrepreneurial sector</li> <li>• Recently updated regulatory framework that provides businesses in Poland with more flexible solutions for innovation development</li> <li>• Initiatives within Pillar 5 recently implemented within the Polish population</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Little awareness among businesses on how to implement and benefit from recent regulatory changes and innovative programmes.</li> <li>• Complex commercialization procedures and bureaucratic approach creating barriers towards take-up in digital technologies.</li> <li>• Limited coordinated approach until now between the ministries based on the industry feedback.</li> </ul>

# 1 General context

The objective of this report is to analyse the status of national initiatives on digitising industry in Poland. The analysis has been conducted against the background of the Digitising European Industry (DEI), which was the first industry-focused initiative of the Digital Single Market launched by the European Commission in 2016.

Similar country reports will be produced for each of the 28 EU Member States. These national reports allow to:

- Monitor the development of national initiatives on digitising industry;
- Compare different national approaches; and
- Identify best practices of national initiatives.

Monitoring and reporting back on the development of the existing national initiatives is an important element of the DEI initiative, and this report should be seen as one part of it.

For more details about the DEI and our methodological approach for the country report, please consult the document attached.

## 1.1 Economic context and status on digitisation

### ***General economic context***

Poland's economic growth in the last few years has been strong, with one of the EU highest real GDP growths in 2017. Domestic demand in 2016 and 2017 remained the main driver of growth, although there was a slowdown in the number of investments during that period. High private consumption was supported by favourable labour market conditions, increased fiscal transfers and strong consumer confidence. Between 2015 and 2017 the yearly GDP growth average was 3.9%, with the following growth per year: 3.8% (2015), 3.1% (2016), 4.8% (2017) according to Eurostat data. During the same period, the GDP per capita increased by 8%. The expectation is that growth will remain strong in 2018 and 2019, with the EU funding projected to remain a main stimulus to public and private consumption continuing to be robust. The expected real GDP growth is 4.2% in 2018 and 3.6% in 2019.<sup>1</sup>

Following the trend of falling population since 2013, the labour market in Poland is expected to experience limited potential growth. Migration flows are likely to be a key driver for the future working age population trends and developments.

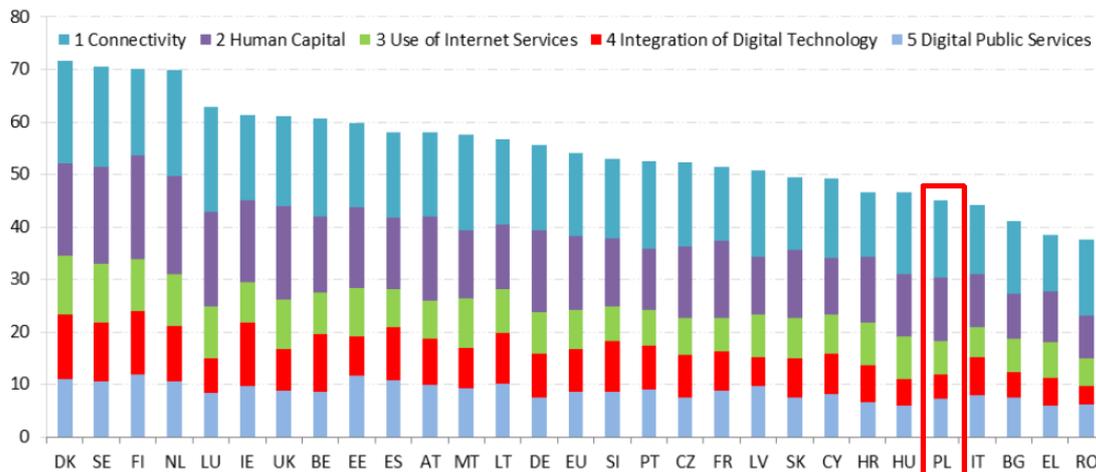
The Polish economy is composed of a strong service and industry sector. In 2017, the industry had a share of the gross value added (GVA) of about 27%, which is above the EU-average of 19.6% (Eurostat). Automotive industry is particularly strong in Poland and accounts for 13% of national export. However, advanced manufacturing in Poland lags behind other EU Member States and the market experiences labour productivity gap<sup>2</sup>.

### ***Status of digitisation***

Poland belongs to the low-performing cluster of countries in terms of digitalisation and ranks 24<sup>th</sup> out of 28 EU Member States according to Digital Economy and Social Index (2018). There has

been no change in Poland's position compared to DESI 2017 overall ranking, however Poland is steadily progressing since 2014, in line with the overall EU-28 DESI evolution results.

**Figure 1: Digital Economy and Society Index**



Source: DESI 2018 Country report – Poland

Nevertheless, based on the current results, all five sub-indicators remain below the EU average. Compared to the results from DESI 2017, Poland's position improved in ranking in the dimension of Connectivity (21<sup>st</sup> place) and Human Capital (20<sup>th</sup> place) and it has a higher score in the Use of Internet and Integration of Digital Technology, while its ranking remains similar to the previous year (25<sup>th</sup> place and 27<sup>th</sup> place respectively). Regarding the Digital Public Services dimension, there is a significant drop in ranking between DESI 2018 and 2017 results, namely from 18<sup>th</sup> to 24<sup>th</sup> position. Poland is currently implementing the Operational Programme Digital Poland for 2014-2020 (OPDP, 'Program Operacyjny Polska Cyfrowa') co-financed by the EU structural funds, which is expected to address some of the most pressing points indicated in the DESI Index 2018<sup>3</sup>.

Poland seems to have improved notably in terms of broadband take-up have notably improved, that is mobile, fast and ultra-fast (Connectivity). There is also a moderate development in all Human Capital indicators, with the growing number of STEM graduates (above the EU average) and an increase in the 'at least basic digital skills' in the population (46%), however, over half of the adult population demonstrates a lack of them. The percentage of the ICT specialists is also below the EU average, but there is a positive tendency when comparing previous results of DESI. There are improvements in the usage of video calls, social networks and online shopping in Poland (Use of Internet Services) as well as most indicators within the Integration of Digital Technology sub-index (electronic information sharing, the use of cloud services and eInvoices).

According to the World Economic Forum's Readiness for the Future of Production Report 2018, Poland's main drivers of production are its sustainable resources and global trade & investment, as presented in the figure below.

**Figure 2: Poland's readiness for future production**

Readiness Overall Assessment				
Drivers of Production				5.8
Driver	Weighting	Rank	Score /10	
 Technology & Innovation	20%	37th	4.8	
 Human Capital	20%	36th	5.7	
 Global Trade & Investment	20%	23rd	6.4	
 Institutional Framework	20%	39th	6.1	
 Sustainable Resources	5%	25th	7.1	
 Demand Environment	15%	23rd	5.9	
Structure of Production				6.8
Structure	Weighting	Rank	Score /10	
 Complexity	60%	21st	7.5	
 Scale	40%	15th	5.9	

Source: World Economic Forum, Readiness for the Future of Production Report 2018<sup>4</sup>

The table below summarises some of the economic and digital indicators for Poland.

**Table 3: General economic and digital indicators for Poland**

	% GDP from manufacturing	% GDP growth	DESI position – and change	DESI sub-indicators Human Capital, Use of Internet, Integration of Digital Technology in 2018
Poland	27.2% in 2017	<ul style="list-style-type: none"> <li>3.8% (2015)</li> <li>3.1% (2016)</li> <li>4.8% (2017)</li> </ul>	24 <sup>th</sup> (2017 and 2018)	<ul style="list-style-type: none"> <li>Human Capital: 20<sup>th</sup> (one place higher compared to 2017)</li> <li>Use of Internet Services: 25<sup>th</sup> (one place lower compared to 2017)</li> <li>Integration of Digital Technology: 27<sup>th</sup> (same ranking in 2017)</li> </ul>

## 1.2 National strategy on digitising industry

The table below presents an overview of the national strategies on digitising industry.

**Table 4: National strategies on digitising industry**

Name	Smart Growth Programme (PO IR) <sup>5</sup>	Responsible Development Strategy <sup>6</sup>	Future Industry Platform
Type	National Work Programme	Horizontal strategy	Horizontal strategy
Starting date	2014	2017	To be fully launched in 2019
Objective	Smart Growth 2014-2020 is a key National Work Programme providing financing for R&D. The main objective is to increase the level of innovation in the Polish economy through increasing investments for research among entrepreneurs. Within this programme there is the Operational Programme Digital Poland 2014-2020, operated by the Ministry of Digital Affairs with the aim to strengthen digital foundations for national development.	The Polish government in 2017 adopted the economic strategy - Responsible Development Strategy as a medium and long-term economic policy. The main objective of the Responsible Development Strategy is creating conditions for income growth for Polish residents. The purpose is also supporting Polish companies and entrepreneurs and development of their capital, which will contribute to economic growth in Poland.	The Future Industry Platform (Platforma Przemysłu Przyszłości) is under preparation by the Ministry of Entrepreneurship and Technology and is part of the Responsible Development Plan. Currently the proposal for a Future Industry Platform is following the legislative process and is expected to be operational in the first quarter of 2019. The main objective is to develop a comprehensive national strategy for Industry 4.0.
Ministry/ministries in charge (website, contact person)	Ministry of Investment and Economic and Development Ministry of Digital Affairs <a href="https://www.poir.gov.pl/en/site/about-the-programme/">https://www.poir.gov.pl/en/site/about-the-programme/</a> <a href="https://www.poir.gov.pl/media/59012/szoop_poir_28_06_18.pdf">https://www.poir.gov.pl/media/59012/szoop_poir_28_06_18.pdf</a> <a href="https://www.polskacyfrowa.gov.pl/media/10410/POPC_eng_1632015.pdf">https://www.polskacyfrowa.gov.pl/media/10410/POPC_eng_1632015.pdf</a>	Ministry of Investment and Economic Development Ministry of Finance Ministry of Entrepreneurship and Technology – Jan Staniłko Ministry of Digitalisation – Michał Pukaluk Foundation Future Industry Platform – Andrzej Soldaty <a href="http://www.mii.gov.pl/media/48672/SOR.pdf">http://www.mii.gov.pl/media/48672/SOR.pdf</a> <a href="http://www.smart.gov.pl/">http://www.smart.gov.pl/</a> <a href="https://www.mpit.gov.pl/strony/zadania/wsparcie-przedsiębiorczosci/innowacyjnosc/krajowe-inteligentne-specjalizacje/">https://www.mpit.gov.pl/strony/zadania/wsparcie-przedsiębiorczosci/innowacyjnosc/krajowe-inteligentne-specjalizacje/</a>	Ministry of Entrepreneurship and Technology -- Jan Staniłko Foundation Future Industry Platform -- Andrzej Soldaty

Name	Smart Growth Programme (PO IR) <sup>5</sup>	Responsible Development Strategy <sup>6</sup>	Future Industry Platform
Scope of the strategy/action plan	<p>Smart Growth Programme supports the following thematic objectives related to digitalisation:</p> <ul style="list-style-type: none"> <li>• Thematic Objective 1: Strengthening research, technological development and innovation</li> <li>• Thematic Objective 3: Strengthening the competitiveness of small and medium-sized enterprises.</li> </ul> <p>The most important assumption of PO IR is the support of research and development projects implemented by entrepreneurs in the framework of scientific and industrial consortia and the introduction of the results of these projects on the market. Funding is also directed to companies benefiting from the innovative services provided by the business environment institutions, such as scientific and technological parks and technology transfer centres, as well as the services of the scientific units, which pursue R&amp;D work on behalf of companies. Selected PO IR instruments are targeted at companies planning to expand their activities outside the country.</p>	<p>'Reindustrialisation' and 'Development of innovative companies' are within the scope of this strategy, which is relevant for digitising industry. The primary objective will be to support the ability of national companies to increase their use of innovation to be able to compete in open and global economies. The creation of modern solutions strengthens the demand for a highly qualified workforce, which is to be addressed within the strategy, while at the same time increasing number of automation processes is expected. Developing highly specialized knowledge and an increase within industries and services traditionally considered to be low-knowledge and technical areas will be targeted. It is also a condition for moving companies from Poland into global chains in the direction of higher value-added jobs.</p>	<p>Foundation of the Future Industry Platform (Fundacja Platforma Przemysłu Przyszłości) responsible for the implementation of the platform, with the goal to promote the competitiveness of entrepreneurs by supporting their digital transformation in terms of processes, products and business models, using the latest developments in the field of automation, artificial intelligence, ICT and communication between machines. The key technologies addressed by the initiatives include: IoT, Cyber Security, Robotics and Automation Machinery, Big Data and Data Analytics, 3D-Printing, AI.</p>
Measures included in the strategy/action plan	<p>The measures within the Programme are concentrated mainly on strengthening the links between businesses and science and thereby increasing the commercialization of the R&amp;D results.</p> <p>The programme is based on four priority axes:</p> <ol style="list-style-type: none"> <li>1. Financing of R&amp;D activities in enterprises and sectoral programmes R&amp;D</li> </ol>	<p><u>Reindustrialisation</u>: measures will focus on developing conditions for the creation and implementation of innovative industrial solutions in the industry. It will be achieved through supporting research and business projects carried out by domestic economic operators in organizational and financial terms, under domestic key clusters, platforms, agreements. They will be supported by the development and</p>	<p>In 2016 the Industrial Transformation Team was set up by the government comprising ministry and industry representatives organised within five working groups: 1. Standards, norms, infrastructure and smart industry specialisation; 2. Digital industry support; 3. Intelligent software and data processing; 4. Education, competence and human resources for Industry 4.0; and 5. Legal framework for the functioning of</p>

Name	Smart Growth Programme (PO IR) <sup>5</sup>	Responsible Development Strategy <sup>6</sup>	Future Industry Platform
	<p>2. Infrastructure (e.g. for research activities) and economic potential of companies R&amp;D and Poland.</p> <p>3. Support for innovation in enterprises by increasing the activity of private investors (seed funds, venture funds Capital, business angels) in the area of R&amp;D &amp; I.</p> <p>4. Research and development activities conducted by scientific and scientific consortia in strategic research programmes, regional research agendas (Smart specialisation), and application projects.</p> <p>Within the Financial Perspective 2014 – 2020, National Smart specialisation (KIS) has been established. National Smart Specialisation points to preferences in providing support for the development of research, development and innovation in the financial perspectives for the period 2014-2020.</p> <p>Digital Poland 2014 – 2020 with its aim to strengthen digital foundations for the national development includes key foundations: common access to a high-speed Internet, effective and user-friendly public e-services and a continuously rising level of digital competences of the society.</p>	<p>a broader use of new ground-breaking products and technologies.</p> <p><u>Development of innovative companies:</u> measures will focus on promoting a culture of entrepreneurship in universities, strengthening research capacities and the introduction of changes in the education system and public administration through programmes fostering innovation take-up and skills development.</p>	<p>Industry 4.0. The main tasks of the Future Industry Platform are as follows:</p> <ul style="list-style-type: none"> <li>• Integrating private and public stakeholders in the field of industrial transformation</li> <li>• Building awareness among Polish enterprises about the technological and business opportunities carried by the Industry 4.0.</li> <li>• Providing advice and support to companies regarding the application of new digital and boosting networking opportunities within competence centres.</li> </ul>
Overall funding and distribution by volume and source of funding (public/private, EU/national)	Total budget around 10.2 billion EUR (around 8.6 billion from EUR (ERDF fund) <sup>7</sup>	Total public funds, incl. EU EFSI funding and other EU: around 350 billion EUR. Total private funds: around 167.5 billion EUR <sup>8</sup>	Around 15 million EUR budgeted for 2019-2021 (public and private funding).

### ***Impacts, challenges and perceptions***

According to the European Smart Specialisation Platform, Poland's smart specialisation strategy focuses on the following priorities: healthy society, bio-economy comprising agri-food, forestry and environment, innovative technologies and industrial processes, sustainable energy and natural resources and waste management.<sup>9</sup> The Polish smart specialisation strategy is reflected in the Responsible Development Strategy with the main objectives to simulate reindustrialisation and development of innovative companies.

Within the Responsible Development Strategy several industries were identified where Poland could become a competitive leader globally, such as aviation, arms industry, car components, shipbuilding industry, IT, chemical industry, furniture, food processing. There were also national and regional smart specialisations defined within the Smart Growth Programme, in order to streamline and coordinate their development. The Smart Growth Programme was identified by the national authorities as part of the national strategy supporting digitalisation of the industry.

Several flagship projects were set-up that are expected to boost Polish 'reindustrialisation' process in the following year, including:

- The Żwirko i Wigura project - stimulating the development of integrated management systems gaining data from unmanned aerial vehicles - services based on the use of drones.
- The Batory project - stimulating the development of technologies, design and construction of Polish floating units and maritime structures
- Enigma Cyber-Park - it is planned to establish a centre and equip it with the capacity to compete on the European market for specialist IT services
- The Luxtorpeda 2.0 project - stimulating the development of technologies, production of Polish rail vehicles, in particular the vehicles for passenger transport.

Additionally, as pointed about by national authorities, the National Smart Specialisation related specifically to the digitisation of the economy is the specialisation Intelligent Networks and Geoinformation Technologies. The term 'Intelligent Networks' means ICT and technologies used in a variety of infrastructures (e.g. energy, transport, telecommunications, health, factories, houses, cities, vehicles) to ensure, among others, optimization of operations, saving of resources including energy, environmental protection, ergonomics of use, benefits of mutual communication and information exchange. Intelligent networks and systems are characterized by the following features: autonomy, the ability to self-organize, adapt and make decisions, resistance to errors and failures, scalability, predictability of service quality assurance, openness of architecture, ICT security.<sup>10</sup>

Additionally, the Future Industry Platform Foundation (Fundacja Platforma Przemysłu Przyszłości - PPP) is under preparation by the Ministry of Entrepreneurship and Technology and is part of the Responsible Development Plan. Currently the proposal for a Future Industry Platform has ended the legislative process and is expected to be operational in the second quarter of 2019.<sup>11</sup>

### **1.3 EU cooperation in the field of digitising industry initiatives**

Poland cooperates with the ICT Innovation for Manufacturing SMEs (I4MS) through innovation centres located in various cities in Poland. Below some of the examples:

- DIH in Poznan (HPC4Poland)
- IoT in Torun (IoT North Poland)
- DIH in Krakow (CYBERSEC HUB)
- DIH in Gdansk (3Hub - Pomeranian Digital Innovation Hub Institute of Fluid Flow Machinery Polish Academy of Sciences)
- Competence Centre in Krakow (Silesia Competence Centre Industry 4.0)
- DIH in Krakow (KIP DIH)
- Automation and Robotics Hub in Warsaw<sup>12</sup>

The cooperation is centred around the development of the innovative manufacturing sector and support for SMEs. The activities of the above DIHs include technical support, infrastructure, testing, access to finance, support of new product and start-up development as well as ecosystem building and networking (High Performance Computing, Robotics, Internet of Things, Smart Manufacturing, AI).

The 2018 edition of the Digital Innovation Hubs annual event took place in Warsaw, co-organised by the European Commission, the Department of Innovation at the Polish Ministry of Entrepreneurship and Technology, and the EU-funded initiative I4MS. It demonstrates the political commitment from the Polish authorities to be involved in the EU cooperation in the field of digitising industry initiatives.<sup>13</sup>

Additionally, Poland (HPC4Poland and IBCh PAS - Poznan Supercomputing and Networking Centre) is also involved in the EU cooperation through Supercomputing Exercise for SMEs (SESAME NET) and EIT Digital network according to government feedback. Poland has been part of the Electronic Components and Systems for European Leadership (ECSEL) joint undertaking since 2014<sup>14</sup> and is involved in the Digital Innovation Network (DIGINNO) project, a project for digital innovation network for the Baltic region (Interreg Baltic Sea region)<sup>15</sup>. Additionally, in line with the EU coordinated plan on AI, Poland is in the process of developing a national AI strategy within the Artificial Intelligence Stream of the 'From Paper to Digital Poland' programme (discussed in section 2.1).

Overall, the national authorities are satisfied with the support received from the European Commission in relation to the DEI (score of 4 on a 1-5 scale, 1 being low and 5 being high) and expressed very positive feedback about the benefits that arise through establishing EU cooperation in the field of digitising industries (score 5 on a 1-5 scale). Among the key benefits, Polish authorities mentioned support in the form of individual trainings, workshops and meetings with mentors, knowledge transfer, networking opportunities, access to tools and the possibility of co-financing through different EU funds. The limits of Horizon 2020 for the types of eligible costs classification was mentioned as one of the challenges that they face. The proposed solution would be a higher level of flexibility of the programmes, in particular, in relation to the eligibility of costs.

## **2 Other policy support to digitising industry**

### **2.1 Boosting innovation capacity**

The table below presents an overview of the main initiatives to boost innovation capacity (pillars 2 and 3 of the DEI).

**Table 5: National initiatives to boost innovation capacity**

Name	Start in Poland <sup>16</sup>	Polish Industry 4.0 – support for Digital Innovation Hubs	From Paper to Digital Poland <sup>17</sup>
Type	Ecosystem for start-ups	Support program for Digital Innovation Hubs	Digital platform for e-government services
Starting date	2016	To be fully launched in 2019 (Q2)	2016
Objective	'Start in Poland' is a governmental programme comprising several initiatives to foster the creation of innovative businesses within the country.	The objective is to set up a network of Industry Competence Centres 4.0 in order to support transformation of the domestic manufacturing sector. The competence centres should provide knowledge, skills, technical resources and engineering tools for implementing a national industry transformation program to the Industry 4.0 level.	It aims to create a digital infrastructure that enables individuals to use a broad variety of services in several application areas.
Relevant for Pillar 2 <sup>18</sup> or Pillar 3 <sup>19</sup> or both	Pillar 3	Pillar 2	Pillars 2 and 3
Short description	The program fosters activities at all development stages, from incubation and acceleration, to development and international expansion. With the program, Poland intends to create 1.500 start-up companies during the next 7 years that will develop high quality innovative technologies.	The DIH should create a solution library and a knowledge transfer program, with particular focus on SMEs. Activities of the centres should be linked to national R&D programs on Industry 4.0, vocational training programs and international cooperation programs. They should support the creation of new business models according to Industry 4.0 (horizontal integration in value creation chains).	Objectives of the Program "From paper to digital Poland" include: improving the functioning and better use of public infrastructure, more efficient fulfilment of their functions by the state and providing conditions for the development of digital skills among citizens and businesses. The programme aims to develop e-government and digitalisation of the Polish economy and is part of the Responsible Development Plan. Within 9 working stream the most relevant for digitising industry are: the AI stream and the IoT stream.

Name	Start in Poland <sup>16</sup>	Polish Industry 4.0 – support for Digital Innovation Hubs	From Paper to Digital Poland <sup>17</sup>
Granting organisation	Ministry of Investment and Economic Development Ministry of Entrepreneurship and Technology	Ministry of Entrepreneurship and Technology Foundation of the Future Industry Platform	Ministry of Digital Affairs Ministry of Finance Ministry of Entrepreneurship and Technology
Participating organisations	PARP	Digital Innovation Hubs Organisations supported through the Ministry of Digital Affairs	Ministry of Infrastructure Ministry of Education Ministry of Health
Sectors targeted	All	All	All
Technologies targeted	All	IoT, Cyber Security, Robotics and Automation Machinery, Big Data and Data Analytics, 3D-Printing, AI	All
Funding (split by private/public and national/EU), state period/annual funding	Around 3 billion PLN (around 0.7 billion EUR) <sup>20</sup>	Public funds (in the implementation phase) Public-private (at further stages) Planned budget: (public funds) 2019 PLN 21.1 million (around 4.9 million EUR) 2020 PLN 21,6 million (around 5 million EUR) 2021 PLN 22.1 million (around 5.2 million EUR)	Financed within the “Digital Poland 2014-2020” work program.
Current status of initiatives	Ongoing	To be launched	Ongoing

## ***Start in Poland***

Since launching the Start in Poland (SIP) programme, many support instruments for start-ups have been announced and further ones are under preparation. SIP is the largest program for start-ups in Central and Eastern Europe, in which the financial support of young, innovative companies has been consolidated. The SIP programme includes a number of government initiatives addressed to start-ups locating their business in Poland. It creates favourable conditions for them to operate at every stage of their development, that is the incubation and acceleration phase, through development and international expansion. The program will accelerate the comprehensive development of the ecosystem that is conducive not only to the development of start-ups, but also sharing knowledge and intellectual property, establishing long-term cooperation between companies of various sizes, as well as attracting talents from abroad.

The Scale-up acceleration phase (pilot), was carried out by PARP during the period 2017 until April 2018 (15 months). Within the pilot, 10 accelerators were selected that in the acceleration process cooperate with 31 large companies from various industries (including energy, fintech, food, health care, automotive, machinery, transport). Young companies undergo a tailored program created in a partnership with experienced accelerators, thanks to which they gain not only access to high-class mentors, infrastructure, but also clients and large corporation markets.

The first competition for capital funds (management groups) was launched in May 2017 under the Polish Development Fund and will be implemented by the Starter component. Capital investments in start-ups are directed in this component to the stage of early development of enterprises (pre-seed, seed). They will identify ideas based on innovative solutions and will verify the market potential of presented ideas.

Within the Biznest component, focusing on connecting start-ups with businesses, the consultation process with Business Angels have been initiated. Work is also underway on the preparation of the Polish Prize component, the aim of which will be to encourage entrepreneurs from abroad to open business operations in Poland (within PFR Ventures, which will be discussed in section 2.4 'Support mechanisms'.<sup>21</sup>

## ***Polish Industry 4.0 – support for Digital Innovation Hubs***

The competence centres (Polish Industry 4.0) should create a solution library and a knowledge transfer program, with particular focus on SMEs. Activities of the centres should be linked to national R&D programs on Industry 4.0, vocational training programs and international cooperation programs. They should support the creation of new business models according to Industry 4.0 (horizontal integration in value creation chains).

In 2018 Śląskie Centrum Kompetencji Przemysłu 4.0 began operations in a city within the industrial region of Poland - Gliwice. It is to be a centre supporting entrepreneurs in the implementation and application of technology 4.0 industry, as well as dealing with broadly understood promotion and education in the field of new technologies.<sup>22</sup> Additionally, there are several other competence centres (e.g. Mazowieckie Industry 4.0 Centre, Jaworznicke Industry 4.0 Centre) that are in the process of preparation.<sup>23,24</sup>

The awareness among industry stakeholders about the Polish Industry 4.0 is high and it is perceived as very useful (score of 4.5 on a 1-5 scale, 1 being low and 5 being high). The level of up-take of digital technology related to the initiative was perceived as moderate (score of 3 on the

same scale). The challenges identified in relation to the initiative were its rather high focus on academia and the need to increase the involvement of businesses.

### ***From Paper to Digital Poland***

The programme From Paper to Digital Poland is aiming at the development of e-government and digitalisation of the Polish economy and is part of the Responsible Development Plan. The programme is divided into 9 working streams and involves work of six ministries. As part of the "From paper to digital Poland" Program, there are currently nine working streams:

- Stream Digital Public Services
- e-Reporting stream
- The Distributed Register Stream (former Blockchain)
- e-Transport stream and e-flows of goods
- Stream Increases Cashless Transactions
- The stream e-Invoice and e-Receipt
- The E-education stream
- The Artificial Intelligence Stream
- Internet of Things stream

Among some of the activities in a pipeline for the two most relevant streams for digitising industry are:

- **The Artificial Intelligence Stream:** the main goal is to build a platform which would develop synergies within various industries and sectors as well as allow for a better integration of activities within the ministries. The next step will be to prepare a centralised Polish AI development strategy.
- **Internet of Things stream:** the activities undertaken within this stream stimulate the dialogue with representatives of the business environment and will allow to develop standards leading to the construction of comprehensive and universal solutions. Members of the stream plan to issue a report by the end of 2019 that will cross-sectionally present the state of the Polish IoT.

The industry stakeholders were familiar with the From Paper to Digital Poland initiative and perceived it as very useful (score of 4.5 on a 1-5 scale, 1 being low and 5 being high). The level of up-take of digital technology in relation to the initiative was perceived as moderate (score of 3 on the same scale).

### ***Impacts, challenges and perceptions***

The growth rate of the ICT sector based on the press release of the Ministry of Investment and Economic Development (2017) in Poland is high, which is reflected in the value of generated production, which increased by 20.57% over 2010-2016. At the same time, the share of the ICT sector in Polish GDP is still relatively low, however this indicates a large potential for development. In Poland, this sector is responsible for 6.06% of GDP in 2016.<sup>25</sup> The majority of indicators within the Integration of Digital Technology sub-index (electronic information sharing, RFID, the use of cloud services, social media and eInvoices) of DESI 2018 demonstrate a positive trend, with no change in the overall rank of Poland within this sub index. The total CAPEX spending as percentage of GDP decreased from 2015 to 2016 (20% in 2015, 18% in 2016 based on OECD).

On a positive note, the number of start-ups in Poland increased by 4% between 2016 and 2017, according to ExMetrix (2018) data, but the growth is expected to slow down due to the saturation of the market.<sup>26</sup> The percentage of enterprises employing ICT specialists remained at around 12% level between 2015 and 2017 as per Eurostat data.

When asked about the perceived level of innovation in digital industries (ICT, digital platforms) in Poland compared with other Member States, the industry perception was 3 (on a 1-5 scale, 1 being low and 5 being high). Regarding the level of take-up of digital technologies by non-ICT industries the score was slightly lower, namely 2.5 (same scale). Overall, industry representatives find government support for digital transformation useful (score of 4 on a 1-5 scale). The government on the other hand, sees both the level of innovation in digital industries and the take-up of digital technologies by non-ICT sectors as positive (score of 4 in each category on a 1-5 scale).

Regarding the key opportunities related to the take-up in digital technologies in Poland, the industry representatives mentioned higher efficiency and productivity for businesses via process optimisation, creation of new business models and increased opportunities for internationalisation for entrepreneurs. The lack of funding and resources for investments, complex and inefficient commercialization procedures and bureaucratic approach from the authorities were among the key challenges and barriers related to take-up in digital technologies. Also, the level of coordination among various initiatives supporting digital technologies was perceived as low (score of 1 on a 1-5 scale).

The European Commission Smart Specialization Platform indicates the following six Digital Innovation Hubs operating in Poland:<sup>27</sup>

- Centre for Advanced Manufacturing Technologies, Wroclaw University of Science and Technology
- CYBERSEC HUB
- HPC4Poland
- Institute of Electron Technology (ITE)
- NASK National Research Institute
- PIAP HUB

On the other hand, based on the government feedback there are currently 59 certified business environment institutions in Poland in total as well as around 150 innovation clusters. There are around 300 businesses using competence centres in the field of digital innovation. Additionally, within the Smart Growth Programme (action 2.3.2), 533 innovation vouchers have been granted to SMEs.

## **2.2 Regulatory framework for digital age**

The table below presents the main initiatives related to a digital regulatory framework (Pillar 4 of the DEI).

**Table 6: Main initiatives for a digital regulatory framework**

Name	Innovation Act <sup>28</sup>	The Constitution of Business <sup>29</sup>	National Cybersecurity System <sup>30</sup>
Type	Tax incentives and R&D support for businesses	Package of laws supporting businesses	IT Security regulation
Starting date	2017 & 2018	30 <sup>th</sup> April 2018	2018
Objective	The objective of the Innovation Act is to provide better support for innovative businesses and start-ups.	The Constitution of Business is a package of laws that aim to reform and simplify business regulations in Poland and lead to increased business activity in the following years.	The objective is to create a National Cybersecurity System, which will detect, prevent and minimize the effects of attacks violating the country's IT.
Short description	The purpose of the Act is to eliminate or reduce barriers to conducting innovative activities and to increase the attractiveness of tax instruments for supporting innovative activities in Poland. The amendment focuses primarily on issues related to the creation of knowledge and its transfer to the economy, as well as financing the processes of creating innovative undertakings, especially increasing private expenditure on research and development.	The changes introduced by the Business Constitution concern areas such as: <ul style="list-style-type: none"> <li>• relations between the entrepreneur and offices and dealing with official insurances</li> <li>• starting a business</li> <li>• suspension of operations</li> <li>• principles of creating commercial law</li> <li>• duties related to running a business</li> </ul>	Based on the new law the National Cybersecurity System will be established (Krajowy System Cyberbezpieczeństwa - KSC), which implements the EU 'NIS' Directive.
Sectors targeted	All	All	Cybersecurity

The **Constitution of Business** is five completely new acts, which mostly came into force on the last day of April 2018. They will lead to a change in 200 legal acts with the objective to simplify business regulations in Poland and lead to increased business activity in the following years. The benefits for businesses include a simplified registration process, exemption from the obligation to pay social security contributions for the first six months of operation for new businesses and simplified taxation<sup>31</sup>.

The purpose of the **Innovation Act** (Journal of Law 2017, item 2201) that came into force from 1<sup>st</sup> January 2018 is to further eliminate or reduce barriers to conducting innovative activities and to increase the attractiveness of tax instruments for supporting innovative activities in Poland. It is the so-called second act on innovation (the first one was implemented in 2017). It increases, among others tax relief for entrepreneurs for research and development up to 100% (up to 50% before) and enables universities to create companies to manage research infrastructure.

In August 2018, the Polish President signed the Act regarding the update of the regulation within the cybersecurity area (Journal of Law 2018, item 1560). Based on the new law, the **National Cybersecurity System** will be established (Krajowy System Cyberbezpieczenstwa - KSC), which implements the EU 'NIS' Directive. The KSC will detect, prevent and minimize the effects of attacks violating the country's IT.

### ***Impacts, challenges and perceptions***

The industry perception about improvements to the regulatory framework is moderate but there is high awareness about the regulatory changes. Industry representatives were all aware of the recent regulatory changes and acknowledge their usefulness. However, it was indicated that further improvements are needed to enable business to take full advantage of the opportunities arising from digitalisation. When asked to what extent they consider the regulatory framework in Poland fit for digital age the score was 2.5 (on a 1-5 scale). Industry representatives indicated that the main regulatory barriers that impede the ability of businesses to innovate and make use of digital technologies were complicated public procurement processes, rigid and unclear regulations in general and limited incentives for innovators.

## **2.3 Skills development**

The table below presents an overview of the main measures for digital skills development (Pillar 5 of the DEI).

**Table 7: Main initiatives to develop digital skills**

Name	Innovative solutions for digital activation <sup>32</sup>	Training activities for the development of digital competences <sup>33</sup>	'Technician – programmer' programme	The broad alliance on digital skills in Poland <sup>34</sup>
Type	Educational Training	Educational Training	Education Programme	Cross-sectoral Industry Alliance
Starting date	2018	2017	2018	2013
Objective	The objective is increasing the degree and improving the ability to use Internet, including the public e-services. In particular, the e-activation of individuals with at least basic digital competences, the development of secondary digital competences, including strictly IT skills and stimulating creativity and promoting the interdisciplinary cooperation (within measure 3.1 of Programme Digital Poland).	The aim of the initiative is to support teachers of early childhood education in acquiring the qualifications needed to conduct programming science, which is a mandatory based on the curriculum base. The activity is intended to provide training for teachers of early childhood education and the purchase of equipment.	The objective is to initiate a formal education for a new job called 'Technician-programmer' in application development and testing and the creation and administration of websites and databases within specialized technical schools (vocational high schools). The main purpose is to increase the number of well-prepared programmers and designers in the Polish economy.	The aim of the programme is to initiate and support activities leading to enhance university digital skills education, promoting good practices and popularizing digital technologies in Poland.
Short description	The action is part of a broad process aimed at the long-term preparation of the human resources to the modern economy. Non-governmental organizations together with local government units receive grants for organisation of training for local society in different areas of internet usage.	Centrum Projektów Polska Cyfrowa (CPPC) announced three competitions for non-governmental organizations, local government units and aimed at supporting teachers in in programming teaching (within measure 3.2 of Programme Digital Poland). In all projects the trainings will be held until June 2023 and will be attended by at least 11,000 teachers and	The initiative aims to adapt the requirements for the professional preparation of future technician-programmers via tailored educational path in vocational schools. A technician is to be a graduate of a vocational school who can write computer programs using a programming language. The technician should be prepared to work in a team of developers and provide support	The alliance acknowledges the need to prepare society graduates for a radically different marketplace, where digital technologies are becoming more and more present. It brings together both public institutions and the private sector to jointly act towards the common goal of digital literacy enhancement in Poland.

Name	Innovative solutions for digital activation <sup>32</sup>	Training activities for the development of digital competences <sup>33</sup>	'Technician – programmer' programme	The broad alliance on digital skills in Poland <sup>34</sup>
		trainers, as well as 125,000 students in Poland. The trainings are expected to help teachers in everyday work with students that will facilitate their movement in the digital world, allow them to use e-learning educational materials and create their own e-resources.	in the implementation of programming tasks and software testing. In addition, the knowledge, skills and social competence of the graduate will allow him or her to continue the further educational path in this profession.	
Granting organisation	Centrum Projektów Polska Cyfrowa	Centrum Projektów Polska Cyfrowa	Ministry of National Education (upon request of the Ministry of Digital Affairs)	Ministry of Digital Affairs
Participating organisations	Ministry of Digital Affairs Ministry of Investment and Economic Development	Ministry of Digital Affairs Ministry of Investment and Economic Development	Technical schools, local authorities	PTI (Polskie Towarzystwo Informatyczne) Polish universities, private businesses Representatives of all sectors (public, business and NGOs, scientific organizations)
Sectors targeted	All	Education	ICT	All
Funding (split by private/public and national/EU), state period/annual funding	About 35 million EUR within Programme Digital Poland 2014-2020 (EU funding ERDF)	About 23 million EUR within the Programme Digital Poland 2014-2020 (EU funding ERDF)	Public funding	N/A
Current status of initiatives	Ongoing	Ongoing	Ongoing	Ongoing

### ***Impacts, challenges and perceptions***

There are some relatively new initiatives implemented within Pillar 5. The broad **alliance on digital skills** in Poland is an interesting example of the public-private cooperation where an ICT-association engages with various stakeholders, such as private telecom companies and universities. In the past two years the alliance announced annually a list of 100 people proposed by the members of the alliance, who significantly contributed to the improvement of digital skills in Poland. In 2018, the shortlisted individuals included representatives from institutions such as Google, Orange Poland, Ministry of Digital Affairs and several public universities.

The **Centre of Digital Poland Projects** (Centrum Projektów Polska Cyfrowa - CPPC) announced three competitions for non-governmental organisations and local government aimed at supporting teachers in programming teaching, allow them to use e-learning educational materials and create their own e-resources. The amount allocated for co-financing is around PLN 100 million (around 23 million EUR). The programme is financed with the EU funds from the Operational Program Digital Poland (POPC). The trainings will be held until June 2023 and will be attended by at least 11,000 teachers and trainers in Poland – with the attendees representing at least 15% from each province, from schools of any type, both public and non-public. The trainings will be conducted in a mixed form (stationary and remote classes), mentoring and access to the e-learning platform will also be provided. The CPPC also supports teachers of early childhood education in acquiring the qualifications needed to conduct programming science, which is a mandatory based on the curriculum base. The intention is to provide training for teachers of early childhood education and the purchase of equipment.

There is a notable improvement in the percentage of the population with at least basic digital skills in the last few years and a growing tendency in the area of employment of ICT Specialists within the same period (DESI 2018). The industry perception on the improvements in the area of digital skills in Poland is positive. When asked to what extent the digital skills of the workforce have improved since 2015 the industry representatives gave the score of 3 (on a 1-5 scale). The initiative 'The broad alliance on digital skills in Poland' was perceived as very important (score of 4 on the same scale), it was noted though that it only covers the development of basic digital skills.

The national authorities indicated that the main tool for measuring digital literacy in Poland is the quantitative study carried out by National Statistics Authorities on a sample of representative citizens aged 16-74 years. The questionnaire is in line with the Eurostat survey (Community Survey on ICT Usage in Households and by Individuals) and is continuously adjusted to the changes made to the Eurostat model questionnaire. In addition, in 2018, the Ministry of Digital Affairs is currently working on modifying the questionnaire to simplify the questions. According to national authorities, there is a clear increase of women enrolling in technical studies (from 31% in 2007 to 37% in 2017), which is a positive trend.

Based on the quantitative indicators there is no indication of the impact of the current programmes on the improvement of digital skills. According to the national authorities the results are expected to be visible in the following years and will be carefully monitored. Among the recent initiatives, the national authorities also mentioned programmes such as 'Scaling-up of good practices', 'Centre of Digital Championship' and other initiatives undertaken under the Operational Programme Digital Poland and the Operational Programme Knowledge Education Development. At the moment there are no tax incentives in place for programmes within Pillar 5. Funds for

training in digital skills improvement can be obtained through competitions organised within the above-mentioned operational programmes.

## 2.4 Support mechanisms

### ***PFR Ventures (Polski Fundusz Rozwoju)***<sup>35</sup>

In 2016, the Polish government set up a new investment platform ‘PFR Ventures’ financed from European funds, such as the ‘Smart Growth Operational Program 2014 – 2020’, and private funds from selected financial agents that are used to create private investment trusts. Through the creation of the Polish Development Fund (PDF) as a part of the ‘Responsible Development Strategy’, the PFR Ventures offers financial instruments for start-ups and SMEs. The choice of investment projects is based on clearly defined and publicly available criteria in the framework of a competitive and professional investment process. Within the platform, PFR Ventures is able to finance projects at various stages of development and different sizes: from about 50,000 EUR to 15 million EUR for a single project. On 15 May 2017, the first competition for capital funds was launched (‘Starter’ component) within the ‘Start in Poland’ programme, which was discussed above. In 2017, 20 grant agreements were concluded with the total sum of around EUR 23.4 million. In 2018 there was a noticeably increase, with 186 grant agreements concluded for the total sum of around EUR 91.1 million based on the information provided by the national authorities (under Smart Growth Programme – National Smart Specialisation). The total value of projects including the EU contribution is around PLN 2 billion (around EUR 0.5 billion).<sup>36</sup>

The PFR Ventures is the largest Venture Capital investment platform in Central and Eastern Europe and is comprised of five closed-end investment funds: PFR Starter FIZ, PFR Biznest FIZ, PFR Open Innovation FIZ, PFR NCBR CVC and PFR KOFFI FIZ.

**Figure 3: Overview of funds operated by PFR Ventures**<sup>37</sup>

<b>STARTER</b> seed, startup, development	<b>BIZNEST</b> seed, startup, development	<b>CVC</b> startup, growth, expansion	<b>KOFFI</b> development, growth, expansion	<b>OPEN INNOVATIONS</b> startup, development, growth, expansion
AUM <b>EUR 182 m</b>	AUM <b>EUR 65 m</b>	AUM <b>EUR 100 m</b>	AUM <b>EUR 81 m</b>	AUM <b>EUR 100 m</b>
MAX. FUND COMMITMENT <b>EUR 12.5 m</b>	MAX. FUND COMMITMENT* <b>EUR 7.5 m</b>	MAX. FUND COMMITMENT <b>EUR 15 m</b>	MAX. FUND COMMITMENT <b>EUR 15 m</b>	MAX. FUND COMMITMENT <b>EUR 20 m</b>
FoF MAX LEVERAGE <b>80%</b>	FoF MAX LEVERAGE* <b>96%</b>	FoF MAX LEVERAGE <b>50%</b>	FoF MAX LEVERAGE <b>50%</b>	FoF MAX LEVERAGE <b>60%</b>
SINGLE INV. SIZE up to <b>EUR 0.24 m</b>	SINGLE INV. SIZE up to <b>EUR 1.0 m</b>	SINGLE INV. SIZE up to <b>EUR 15 m</b>	SINGLE INV. SIZE up to <b>EUR 0.6-15 m</b>	SINGLE INV. SIZE up to <b>EUR 1.2-10 m</b>
YEAR OF OFFER SELECTION <b>2017-2018</b>	YEAR OF OFFER SELECTION <b>2017-2018</b>	YEAR OF OFFER SELECTION <b>Open till 2020</b>	YEAR OF OFFER SELECTION <b>Open till 2020</b>	YEAR OF OFFER SELECTION <b>2017-2018</b>

\* Contributes only to 50% of the investment, the other 50% comes from Business Angels  
Assets and commitment values are officially fixed in polish zloty (PLN), EUR 1 = PLN 4

Source: PFR Ventures

### ***Innovation vouchers***

Within the Smart Growth 2014-2020 programme, innovation vouchers are handed out to SMEs to stimulate cooperation between science and economy. The initiative is implemented by the Polish Agency for Enterprise Development as an Intermediate Body for Measure 2.3 ‘Pro-innovative services for enterprises. Within the Sub-measure 2.3.2 ‘Vouchers for innovations for

SMEs' stage II (Investment), under priority axis II: 'Support for the environment and the potential of enterprises to conduct R&D activities' competitions are organised and successful projects receive co-financing. The aim of the second stage of the 'Vouchers for Innovations for SMEs' competition is to finance the implementation of ideas for technological innovation developed by the scientific unit in the first stage of the competition. The total pool of funds allocated for co-financing projects for the period 2014-2020 is PLN 5,000,000 (around EUR 1.2 million).<sup>38</sup>

### 3 Conclusions

The following table provides an overview how the different digitalisation initiatives implemented in Poland have been funded.

**Table 8: Breakdown for the financing of the initiatives**

	Pillar 2	Pillar 3	Pillar 4	Pillar 5
	Digital Innovation for all	Partnerships and industrial platforms	Regulatory framework for digital age	Preparing for digital future (skills)
From Paper to Digital Poland	N/A			
Start in Poland		Around 0.7 billion EUR (2016 to date)		
Polish Industry 4.0 – support for DIH	Official launch 2019 (Q2)			
The Constitution of Business			N/A	
Innovation Act			N/A	
National Cybersecurity System			N/A	
Training activities for the development of digital competences				23 million EUR (2017 to date)
The broad alliance on digital skills				N/A (2013 to date)
'Technician – programmer' programme				N/A (2018 to date)
Innovative solutions for digital activation				35 million EUR (2018 to date)
PFR Ventures	Around 0.5 billion EUR (2017 to date)			
Vouchers for innovations for SMEs	Around EUR 1.2 million (2014 to 2020)			
Total spending	<b>At least around 1.26 billion EUR</b>			

Overall, there have been several initiatives launched in Poland in the last few years or are in the pipeline for 2019 on the national level and within the DEI pillars. Although the results have not been yet reflected in the quantitative indicators, they demonstrate the government's commitment to bring innovation to the Polish economy and entrepreneurial sector. Based on the Digital Economy and Social Index (DESI 2018) Poland is steadily progressing since 2014, in line with the overall EU-28 DESI results, but it still belongs to the low-performing cluster of countries in terms of digitalisation. Poland ranks 24th out of 28 EU Member States according to DESI (2018), which indicates that there are several pressing areas of weakness, such a shortage of basic digital skills in population and the number of ICT specialists.

The main measures on the national level addressing the digitalising of the industry so far have been developed through the creation of the Polish smart specialisation strategy within the Responsible Development Programme and providing support to R&D within the Smart Growth Programme. There have been several flagship projects set-up in various locations in Poland with a focus on 'reindustrialisation' and using innovation technologies. Having said that, the new

national strategy towards digitising Polish industry (Future Industry Platform; demand side of the market), expected to become operational in the first quarter of 2019, is a key step in Poland towards development of a centralised and coordinated government approach targeting the Industry 4.0. The expectation from the government is that it will be the main driver for changes in Poland towards digitalisation in the coming years and is a well-coordinated national approach involving key industry stakeholders.

Although the initiatives launched within Pillars 2 and 3 are relatively new, they indicate promising developments in the following years. The activities planned within the AI Stream and the IoT Stream as part of the 'From Paper to Digital Poland' programme indicate the direction of the future work on the centralised AI strategy and monitoring of the state of IoT in Poland. Additionally, the 'Start in Poland' and Industry 4.0 Initiatives focusing on enhancing digitalisation within entrepreneurs and innovative business models demonstrate positive results. There is an increasing number of grant agreements within the VC platform supporting 'Start in Poland' (supply side of the market). There are several Competence Centres that have recently become active and a full launch is planned for 2019 with an annual budget allocation for the next three years. The awareness among industry stakeholders about the Polish Industry 4.0 initiative is high and it is perceived as very useful.

The updated regulatory framework in 2018 (Pillar 4) provides businesses in Poland with more flexible solutions for innovation development through simplification of processes, hefty tax incentives and support for R&D. The implementation of the EU NIS Directive is also an important step towards preparing the Polish regulatory framework for the digital age and risks that are associated with it. The next step would be to increase awareness among business on how to implement and benefit from recent regulatory changes. Given that the industry perception about the improvements to regulatory framework is moderate, there is still room for removing certain bureaucratic barriers.

The recently launched initiatives within Pillar 5 incorporate within the education system certain programmes with the objective to increase digital skills of the Polish population and train students towards professions such as ICT specialists. As this area has been identified as one of the major weaknesses in Poland it is beneficial that these initiatives have been put in place to address the problems. Centre of Digital Poland Projects and their activities are a positive step towards cooperation between various stakeholders with the common aim to support teachers and students in the use of modern technologies.

The box below presents a good practice from Poland.

#### **Box 1: Good practice**

##### **PFR Ventures**

The PFR Ventures being the largest Venture Capital investment platform in Central and Eastern Europe constitutes best practice due to its flexibility in terms of financing projects at various stages of development and different sizes (from about 50,000 EUR to 15 million EUR). On 15 May 2017, the first competition for capital funds was launched ('Starter' component) within the 'Start in Poland' programme, which was discussed above. In 2017, 20 grant agreements were concluded with the total sum of around EUR 23.435 million. In 2018 there was a noticeably increase, with 186 grant agreements concluded for the total sum of around EUR 91.1 million). The growing interest in the participation in the programme and the positive

tendency in terms of the number of grant agreements demonstrates the successful set up and launch of the VC platform according to the government feedback.

To conclude, the table below provides a general overview of the main digitalisation initiatives implemented in Poland, the level of take-up and perception of their impacts as well as the overall progress Poland has made so far with regard to digitalisation.

**Table 9: Total input-output overview**

		Pillar 2	Pillar 3	Pillar 4	Pillar 5
		Digital Innovation for all	Partnerships and industrial platforms	Regulatory framework for digital age	Preparing for digital future (skills)
Application	Name of key initiatives	Polish Industry 4.0 – support for DIH	Start in Poland (2016)	The Constitution of Business National Cybersecurity System Innovation Act	The broad alliance on digital skills 'Technician – programmer' programme Training activities for the development of digital competences Innovative solutions for digital activation
		From Paper to Digital Poland (2016)			
	Funding (total amount and period)	EUR 0.7 billion (between 2016 to date)			EUR 58 million (between 2017 to date)
	Industries addressed	All	All	Cybersecurity	All
	EU programme involved	ERDF funds	N/A	N/A	ERDF funds
Usage	Perception of initiative	Government support is considered as useful (4/5) for digital transformation		The industry perception about improvements to regulatory framework is moderate (3/5).	The digital skills of the workforce are considered to have improved since 2015 (3/5)
	Take-up	59 certified business environment institutions in total around 150 innovation clusters	N/A		N/A
Outcomes	Perception of outcomes	The level of take-up of digital technologies is perceived as moderate (3/5)	The level of innovation in digital industries is perceived as moderate (3.5/5)	Regulatory framework considered as moderately fit for digital age (2.5/5)	The availability of the required skills and labour resources enabling digitisation is perceived as moderate (2.5/5)
	Outcome metrics	Total DESI 24 <sup>th</sup> (2018), same as 2017		The total CAPEX spending as percentage of GDP decreased from 2015 to 2016 by 8%. The number of start-ups in Poland between 2016 and 2017 grew by 4%.	Between 2015 and 2017 the share of enterprises providing training to develop ICT skills remained at the level of 12%. The percentage of enterprises employing ICT specialists also remained around 12%.
	Change in outcomes	From 2017 to 2018, Poland remained at the same position (27 <sup>th</sup> ) in the integration of Digital Technology sub-index.			
End-goal	Productivity growth	Real labour productivity growth per person employed in Poland was 2.3% in 2015, 2.5% in 2016 and 3.4% in 2017 (Eurostat)			
Summary		Poland has recently launched some initiatives with a focus on pillars 2, 3 and 5 and implemented new regulations supporting R&D and entrepreneurship (pillar 4). The new National Strategy on digitizing industry 4.0 is currently in the preparation phase and the 4.0 platform will be launched in 2019, which will reshape the Polish digitising industry in the following years.			

## ANNEX 1 List of stakeholders interviewed

Type of stakeholder	Name of organisation
Government representative	Ministry of Entrepreneurship and Technology, Department of Innovation
Government representative	Ministry of Digital Affairs
Industry association	IAB Poland (Association of the Employers of the Internet Industry)
Industry association	Funding Box Accelerator

## ENDNOTES

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