

MONITORING PROGRESS IN NATIONAL INITIATIVES ON DIGITISING INDUSTRY

Country report

Austria

July 2019



Table of contents

Summary	3
1 General context	8
1.1 Economic context and status on digitisation	8
1.2 National strategies on digitising industry	10
1.3 EU cooperation in the field of digitising industry initiatives	13
2 Other policy support to digitising industry	14
2.1 Boosting innovation capacity	14
2.2 Regulatory framework for digital age	21
2.3 Skills development	23
2.4 Support mechanisms	27
3 Conclusions	30
ANNEX 1 List of stakeholders interviewed	34
Endnotes	34

Tables

Table 1: Overview of initiatives	4
Table 2: SWOT of Austria on digitalisation	7
Table 3: General economic and digital indicators for Austria	10
Table 4: National strategies on digitising industry	11
Table 5: National initiatives to boost innovation capacity	15
Table 6: Main initiative under Pillar 4	22
Table 7: Austrian main initiatives to develop digital skills	24
Table 8: Breakdown for the financing of the initiatives	30
Table 9: Total input-output overview	33

Figures

Figure 1 Digital Economy and Society Index (2018)	9
Figure 2: Austria's readiness for future production	10

Boxes

Box 1: Good practice	31
----------------------------	----

Summary

Austria is part of the group of medium-performers among EU Member States when it comes to digitalisation. On the Digital Economy and Society Index (DESI), Austria ranks 10th in 2018, the same rank as in 2017. Austria achieves very good results in terms of human capital but performs below the EU-average regarding the usage of internet services by citizens. Austria has performed well economically over the last few years. In 2017, Austria reached the highest real Gross Domestic Product (GDP) growth rate since 2011. The economy is based on a strong and highly innovative industrial sector. In 2017, the industry had a share of the gross value added (GVA) of about 22%.

Austria created an industry 4.0 platform in 2015 and established working groups to discuss relevant topics such as pilot factories, digital skills and the regulatory framework. With the Ministry for Digital and Economic Affairs (BMDW), created in January 2018, Austria has a strong federal actor that can centrally steer digitalisation and coordinate different initiatives.

While large Austrian companies and public administration have already advanced significantly in terms of digitalisation, many SMEs seem to lag behind. To address this issue, a number of initiatives have been launched in 2017 and 2018 that altogether cover all Pillars of the Digitising European Industry (DEI). These include the COMET (Competence Centres for Excellent Technologies) Programme, which promotes the development of competence centres with the aim to develop skills and increase internationalisation among Austrian companies (Pillar 2&3 of DEI). The “KMU digital” programme supports SMEs in different ways by a) providing a first status check to identify the digital starting position of an SME, b) offering consulting services on how to digitise the company, and c) providing funding for participation in digital training (Pillar 2&3 of DEI). The Digital Innovation Hubs programme, launched in 2018, also addresses SMEs specifically (Pillar 2 of DEI). Besides, legislative initiatives and working groups have been established with the aim to adjust the regulatory framework for an innovative, digital economy. The Austrian Standardisation Roadmap Industry 4.0, the Digital authority and the Council for robotics and artificial intelligence therefore cover Pillar 4 of DEI. Fit4Internet, Digital Bootcamps and the School 4.0 promote digital skills in Austria (Pillar 5 of DEI). The total funding of the initiatives identified in Austria is currently around EUR 202.65 million, from which around EUR 181 million was allocated for initiatives covering Pillar 2&3 of DEI. Around EUR 21 million funding was dedicated to promoting digital skills (Pillar 5 of DEI). In addition, EUR 666.8 million have been available under support mechanisms.

While many programmes have been launched under pillars 2,3, and 5, there are fewer concrete initiatives to update the regulatory framework. At the moment, many initiatives are under discussion, but further initiatives to adapt the legislative framework to new phenomena, such as the shared economy or autonomous driving, might follow. Table 1 presents an overview of the main initiatives identified, that will be further detailed in this report. Table 2 presents a short SWOT analysis of Austria 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
Industrie 4.0 Austria	2015	Sectoral strategy	Sectoral strategy	Industry	All	All	No specific budget, only membership fees
Digital Roadmap Austria	2017	General strategy	General strategy	All	All	All	No central funding for the strategy provided. Each ministry or agency finances the projects that fall under its responsibility.
Artificial Intelligence Mis Austria 2030	2019	Sectoral strategy	Sectoral strategy	Industry	AI	All	N/A
Base Program	2004	Pillar 2&3	R&D Support	All	N/A	All	EUR 100 million/year
COMET programme	2008	Pillars 2&3	Competence centre	All	All	All	EUR 75 million (2018)
Pilot factories for the industry 4.0	2015	Pillars 2&3	PPP, testbed	All	All	N/A	N/A
KMU digital	2017	Pillars 2	Research & innovation support	Trade & industry	All	SMEs	EUR 3.35 million per year
Digital Innovation Hubs	2018	Pillar 2	DIH	All	Social Media, Mobile Services, Cloud, IoT, Cyber Security, Robotics and Automation Machinery, Big Data and Data Analytics, 3D-Printing, AI	SMEs	EUR 3.3 million (2018)
Pilot Factories	2018	Pillar 2	Pilot factory	Industry	<ul style="list-style-type: none"> • smart electronic based systems • discrete manufacturing 	All	National funding

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
					• process engineering		
(Technology-) Platforms	N/A	Pillar 3	Platforms	Several (among others: manufacturing, textiles)	N/A	N/A	N/A
Österreichischer Normungs-Kompass Industrie 4.0	2016	Pillar 4	National working group	All	N/A	N/A	None
Digitales Amt	2018	Pillar 4	Other regulatory measure	Public administration	N/A	N/A	N/A
Rat für Robotik und KI	2017	Pillar 4	Counseling body	N/A	Robotics, artificial intelligence	N/A	N/A
Industrie 4.0 Österreich Plattform: Arbeitsgruppe Qualifikation und Kompetenzen	2017	Pillar 5	National working group	N/A	N/A	N/A	None
“Learning factory” for Industry 4.0 at the Technical Academy St. Andrä	2017	Pillar 5	Training centre	Industry	N/A	N/A	EUR 20 million
Fit4Internet	2018	Pillar 5	Training centre	N/A	N/A	N/A	Ca. EUR 1 million (2018)
Digital Bootcamps	2018	Pillar 5	Training centre	N/A	For example: artificial intelligence, big data, data engineering, blockchain	N/A	Funding per project: max. EUR 500,000

Initiatives	Starting year	Overall strategy/DEI Pillar/support mechanism	Type of initiative	Sectors targeted	Digital technologies targeted	Size of companies targeted	Budget
Schule 4.0	2017	Pillar 5	Others	Schools	N/A	N/A	Programme of the national government
Endowed professorship (Stiftungsprofessuren)	N/A	Pillar 5	Others	All	N/A	N/A	N/A
Innovation Vouchers	N/A	Support mechanism	Innovation Voucher	All	R&D	SMEs	N/A
Research premium ("Forschungsprämie")	2002	Support mechanism	Tax incentive	N/A	N/A	N/A	The Research Premium provides a reimbursable tax credit for R&D equivalent to a fixed percentage, currently 14%, of firms' validated R&D spending.
Production of the future	2011	Support mechanism	Funding scheme	N/A	All	N/A	EUR 17.6 million
ICT of the future	N/A	Support mechanism	Funding scheme	N/A	All	All	EUR 7 million
Smart and Digital Services-Initiative (SDS-I)	N/A	Support mechanism	Funding scheme	N/A	N/A	All	N/A
Structural Funds	N/A	Support mechanism	Funding scheme	N/A	N/A	All	EUR 34.5 million.
R&D funding	N/A	Support mechanism	Funding scheme	N/A	N/A	All	N/A

Table 2: SWOT of Austria on digitalisation

<p>Strengths:</p> <ul style="list-style-type: none"> • Advanced digitalisation of public administration, notably in the fields of online service completion and pre-filled forms • Austria achieves good results in terms of digital skills, especially regarding: science, technology, engineering and maths (STEM) graduates; ICT specialists; and the number of people having at least basic digital skills. 	<p>Weaknesses:</p> <ul style="list-style-type: none"> • Weak results in relation to use of internet services, in particular social networks, news, and video calls. • Low cloud usage by companies and e-commerce turnover by SMEs. • On connectivity, Austria performs below the EU-average, especially on fast and ultrafast broadband take-up.
<p>Opportunities:</p> <ul style="list-style-type: none"> • With the Ministry for Digital and Economic Affairs (BMDW), Austria has a strong federal actor that can push forward digitalisation and coordinate different initiatives. • The industry 4.0 initiative was launched early (2015) in Austria; its working groups have already covered many different relevant files. • Recently, the federal government has launched different initiatives to support the digitalisation of SMEs (e.g. KMU digital, Digital Innovation Hubs). 	<p>Threats:</p> <ul style="list-style-type: none"> • The regulatory framework in Austria still needs to be adapted to the digital age. • Many pillar-specific initiatives have been launched only within the last year. Their real impact still needs to be seen. • Given that the industrial sector plays a major role in Austria, it is also particularly vulnerable to digital changes.

1 General context

The objective of this report is to analyse the current status of national initiatives on digitising industry in Austria. 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

Austria has performed well economically over the last few years. In 2017, Austria reached the highest real Gross Domestic Product (GDP) growth rate since 2011. Between 2015 and 2017, the GDP per capital, expressed in Purchasing Power Parity (PPP), increased by 2.8%. This robust growth of the Austrian economy has been driven both by private consumption and investment. The 2016 tax reform led to an increase in private consumption that also boosted investment, strengthening domestic demand in 2017¹. Thanks to positive trends in neighbouring countries and in world trade, Austria has increased its exports in 2017. For 2019, the economic outlook remains favourable. GDP growth is expected to be broadly unchanged, driven mainly by stable domestic demand despite a slightly decreasing contribution from investment.

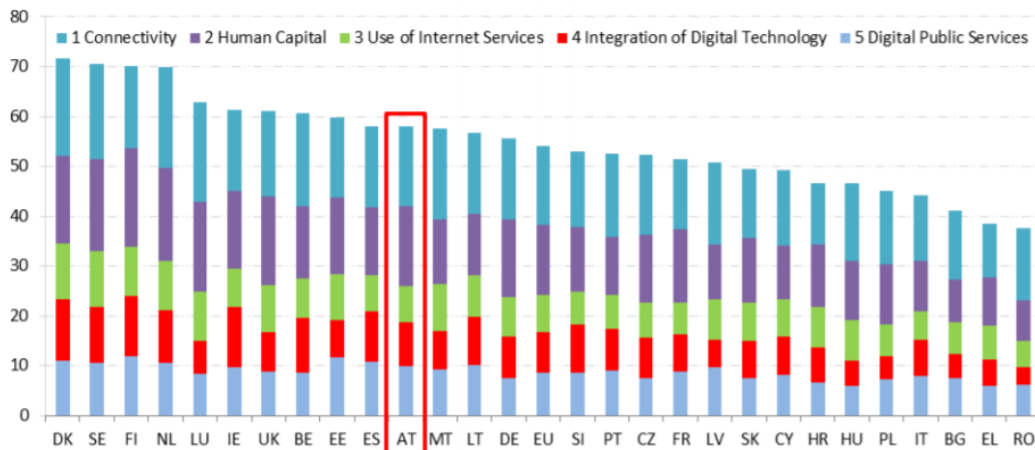
The Austrian economy is based on a strong and highly innovative industrial sector. In 2017, the industry had a share of the gross value added (GVA) of about 22%, which is above the EU-average of 19.6%. There are strong links between industry and science and a high share of public research is funded by industry.

Status of digitisation

While the digitalisation of public administration and large companies is well advanced in Austria, SMEs and micro-enterprises are lagging behind this trend². This view was also shared by one of the government representatives interviewed, who considered that both in ICT- and non-ICT sectors there is still a need for SMEs to catch-up regarding digitalisation. This remaining “digital divide” between large companies and SMEs is even more relevant as the SME sector is particularly important in Austria.

According to the Digital Economy and Society Index (DESI), Austria ranks 10th in 2018, unchanged from the year before. Over the last year, Austria progressed roughly in line with both the EU average and the average for the cluster of medium performing countries³. Austria achieves very good results in terms of Human Capital but performs below the EU-average in terms of usage of internet services by citizens. While Austria ranks 5th EU-wide regarding the share of science, technology, engineering and math (STEM) graduates, it only ranks 24th in terms of usage of social networks. When it comes to the integration of digital technology, Austria scores above the EU-average. Austria performs very well in terms of selling online cross-border (2nd) and electronic information sharing (7th), but performs poorly regarding the usage of cloud services (23rd) and e-commerce turnover (22nd). When looking at the EU Digital Transformation Enablers' Index and the EU Digital Technology Integration Index, the ranking and performance of Austria are aligned with the DESI results. The following figure presents the position of Austria in the EU ranking of the DESI.





Figure 1 Digital Economy and Society Index (2018)



Source: Digital Economy and Society Index (DESI) 2018 – Country Report Austria

As regards Austria's readiness for future production, the assessment carried out by the World Economic Forum in 2018 scores Austria with 6.8 out of 10 for drivers of production and 7.4 for the structure of production. A breakdown of drivers is provided in the figure below.

Figure 2: Austria's readiness for future production

Drivers of Production				6.8
Driver	Weighting	Rank	Score /10	
 Technology & Innovation	20%	21st	6.2	
 Human Capital	20%	18th	6.8	
 Global Trade & Investment	20%	22nd	6.5	
 Institutional Framework	20%	15th	8.0	
 Sustainable Resources	5%	4th	8.7	
 Demand Environment	15%	31st	5.6	
Structure of Production				7.5
Structure	Weighting	Rank	Score /10	
 Complexity	60%	7th	8.7	
 Scale	40%	21st	5.6	

Source: World Economic Forum, Readiness for the Future of Production Report 2018

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

Table 3: General economic and digital indicators for Austria

	% GVA from manufacturing	% increase GDP growth	DESI position – and change	DESI sub-indicators Human Capital, Use of Internet, Integration of Digital Technology in 2018
Austria	21.8 (2017)	1.1% in 2015, 2% in 2016, 2.6% in 2017	11 th (2018), same place as in 2017	<ul style="list-style-type: none"> Human Capital: 7th (no change compared to 2017) Use of Internet Services: 19th (one rank improved compared to 2017) Integration of Digital Technology: 10th (two ranks improved compared to 2017)

1.2 National strategies on digitising industry

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

Table 4: National strategies on digitising industry

Name	Industrie 4.0 Austria	Digital Roadmap Austria	Artificial Intelligence Mission Austria 2030
Type	Sectoral initiative	Horizontal initiative	Sectoral Strategy
Starting date	2015	2017	2019
Objective	The aim is to secure and create highly innovative industrial production in Austria. The aim is also to increase the quality of employment in order to strengthen Austria's future competitiveness.	To develop 12 action fields with about 150 concrete measures to ensure that digitalisation can be a success for Austria.	The White Paper, called "Artificial Intelligence Mission Austria 2030" aims to promote the responsible, public interest-oriented, broad use of AI based on European core values in Austria and the development of measures to address possible dangers and undesirable developments which could result from AI for people and society, to recognize in time, to cushion or to prevent.
Ministry/ministries in charge (website, contact person)	Ministry for Transport, Innovation and Technology http://plattformindustrie40.at/	Federal Ministry for Digital and Economic Affairs ⁴ https://www.digitalroadmap.gv.at/	The Austrian Council for Robotics and Artificial Intelligence https://www.bmvit.gv.at/innovation/publikationen/ikt/aimat.html Federal Ministry for Digital and Economic Issues
Scope of the strategy/action plan	Various working groups are working on proposals on specific topics. These are: <ul style="list-style-type: none"> • Pilot factories; • Standards; • Research, development and innovation; • Qualifications and skills; • Regional strategies; • Human being in the digital factory; • Intelligent logistics; • New business models; and • Security & safety. 	The strategy focuses on broad 12 guiding principles, which were translated into 150 specific measures. The Digital Roadmap Austria gathered for the first time all existing strategies, initiatives and projects regarding digitalisation in Austria.	The strategy focuses on the application areas and benefits of artificial intelligence. Artificial Intelligence Mission Austria 2030 states that the government will be committed to a humane and socially acceptable development of artificial intelligence.
Measures included in the	<ul style="list-style-type: none"> • Networking of business, politics, science and media to successfully implement industry 4.0. 	<ul style="list-style-type: none"> • Maintaining the platform Industry 4.0. • Strengthening networking and improving access to technology 	<ul style="list-style-type: none"> • Under the working title Artificial Intelligence Mission Austria 2030 (AIM AT 2030), the government's strategy is

Name	Industrie 4.0 Austria	Digital Roadmap Austria	Artificial Intelligence Mission Austria 2030
strategy/action plan	<ul style="list-style-type: none"> • Defining key areas of action/priorities and drafting proposals for targeted measures. • Developing strategies for priority areas of research with a high leverage effect for industry 4.0. Implementation of initiatives to achieve synergies between national, regional and international activities. • Providing information to companies, research institutes, politicians and the media about new developments on Industry 4.0. 	<p>through the establishment of digital innovation hubs.</p> <ul style="list-style-type: none"> • Supporting the digital transformation of SMEs through the targeted promotion of advisory and qualification measures in the framework of the new "SME Digital" Support programme from 2017 onwards. • Intensifying the training of ICT professionals and continuous vocational training, especially in the MINT subjects. • Creating a regulatory framework that makes national online business models competitive and takes into account the needs of consumers. • Promoting online (vocational) training courses for the teaching of digital skills as well as retraining, which are oriented towards the concrete needs of the labour market. 	<p>to "set the framework conditions for the prosperous and responsible use of AI in all areas of life". In addition to the White Paper of the Robotics Council, various international studies and EU guidelines serve as the basis. Inter-ministerial working groups are formed for the preparation of the strategy under the auspices of the Ministry of Transport, Innovation and Technology and Ministry for Digital and Economic Issues.</p>
Overall funding and distribution by volume and source of funding (public/private, EU/national).	Membership fees, out of which around ¼ are paid by public stakeholders.	No central funding for the strategy provided. Each ministry or agency finances the projects that fall under its responsibility.	N/A

Impacts, challenges and perceptions

The association “**Industry 4.0 Austria – the Platform for Smart Production Implementation**” has successfully managed to bring together different stakeholders both from the national and the regional level. The different working groups have progressed to a different extent.

The working group on pilot factories is the only one that has completed its work. Based on the strengths of the Austrian economy, the working group developed thematic priorities for the creation of new pilot factories. These were:

- Smart Electronic Based Systems;
- Manufacturing of discrete goods; and
- Process engineering.

These fed into the public tender for new pilot factories launched by BMVIT (Federal Ministry for Transport, Innovation and Technology) and FFG (Austrian Research Promotion Agency), which led to the establishment of three pilot factories (see section 2.1).

The work of the other thematic working groups is still ongoing. Concrete results of the working groups are presented in more detail under pillar 4 (section 2.2) and pillar 5 (section 2.3).

The **Digital Roadmap Austria** was approved by all ministries who were supposed to be in charge of implementing the strategy, including providing the required financial resources from their own budgets as no central funding for the strategy was provided. While the Digital Roadmap was originally steered by the Chancellery, this responsibility shifted with the change of government end of 2017 to the newly created Federal Ministry for Digital and Economic Affairs. The Digital Roadmap will provide the basis for a new digitalisation strategy that is currently being drafted by a task force, composed of chief digital officers of each federal ministry⁵. One concrete result of the strategy was the establishment of the programme “KMU digital” that is presented in Pillars 2 and 3 (section 2.1) below. In 2018, the European Commission found that “Austria’s national digitalisation strategy still lacks monitoring and systematic performance review tools”⁶.

The smart specialisation strategy of Austria focuses on Service Innovations and Tourism, quality of life, bio-economy and sustainability, material sciences and intelligent manufacturing, information and communication technologies, intellectual social and cultural sciences, climate change, life sciences.⁷ Therefore the national strategies for digitising the industry are particularly relevant for the priority fields of intelligent manufacturing and ICT.

1.3 EU cooperation in the field of digitising industry initiatives

According to one of the government representatives interviewed, Austria cooperates with different European initiatives, e.g.:

- Electronic Components and Systems for European Leadership (ECSEL)
- Coordinated plan on artificial intelligence, as part of the Digitising European Industry Initiative

The cooperation with these initiatives focuses on electronics, industry 4.0, artificial intelligence, and data.

Another government interviewee highlighted Austria's cooperation with the German "Plattform Industrie 4.0" and the Swiss "Industrie 2025 Initiative". The cooperation covers:

- Use cases;
- Norms and standards;
- General exchange of experiences; and
- Support of SMEs in digitalisation projects.

The main benefit of these different kinds of cooperation, according to some government representatives interviewed, is to learn from each other's experience, to increase the quality of the work and of the output, and to use established formats. What remains a challenge is to make clear what is the concrete added-value of the cooperation.

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	Base Program	COMET (Competence Centres for Excellent Technologies) programme ⁸	KMU digital ⁹	Digital Innovation Hubs ¹⁰	Pilot factories
Type	R&D Support	Competence centres	Digitalisation support (innovation support and training of advisers)	DIH	Pilot factory
Starting date	2004	2008	2017	2018	2016
Objective	Through the broad, open-ended promotion of research and development, the programs aims to strengthen the competitiveness of the companies located Austria.	The goal is the development of new skills and increased internationalisation as a quality feature of excellent cooperative research. The bundling of these skills in one centre and the common definition of future-oriented topics by science and industry should provide new research impetus, lead to increased technology transfer and strengthen the innovative capacity of companies.	The main objectives are to: <ul style="list-style-type: none"> • Provide information and raise awareness on topics related to the digitalisation of economy, including an overview of existing European and national support measures • Support Austrian SMEs in digitalising 	The funding programme, which was started in November 2018, aims to create the first Digital Innovation Hubs in Austria. The concrete objectives are to: <ul style="list-style-type: none"> • Mobilise Austrian SMEs to actively participate in digital transformation to increase productivity, innovation and creation of value-added and to increase competitiveness through the usage of digital technologies. • Access to expertise and know-how: Institutionalised access for SMEs to expertise and know-how on digitalisation and knowledge 	Together with the Federal Ministry (bmvit) and the Austrian research promotion agency (FFG), the working group Pilot Factories had the task of carrying out a consultation process with companies regarding the thematic focus of the call for tenders for three pilot factories – with the aim of focusing on Austrian fields of strength. The topics should be in the field of industry 4.0, production and ICT or key technologies for industry 4.0, furthermore they should be complementary to the existing pilot factory in Vienna Aspern and to each other. Cooperation within and between the regions is to be strengthened and all pilot factories are to be networked at a later date, thereby covering parts or entire value chains.

Name	Base Program	COMET (Competence Centres for Excellent Technologies) programme ⁸	KMU digital ⁹	Digital Innovation Hubs ¹⁰	Pilot factories
				<p>transfer to companies via training measures.</p> <ul style="list-style-type: none"> Digital innovations in SMEs: Support of digital innovations in SMEs via access to infrastructure, to new business models, joint development of R&D and development of prototypes for digital application. 	
Relevant for Pillar 2 ¹¹ or Pillar 3 ¹² or both	Pillar 2 and 3	Pillars 2 and 3	Pillars 2	Pillar 2	Pillar 2
Short description	The right funding is available for every project phase and size - from brainstorming and a feasibility study, through an initial project start, to the actual company project (experimental development or industrial research, cooperation possible) as well as initial routes to the	The COMET programme promotes the development of competence centres. This programme is handled by the FFG. To implement COMET, 3 programme lines are planned, the "COMET centre (K1 or K2)", the "COMET project" (formerly "K project") and the "COMET module" line.	<p>As part of the government's digitalisation strategy, the BMDW and the WKO support SMEs in digital transformation.</p> <p>The programme offers the following elements:</p> <ol style="list-style-type: none"> Raising awareness and providing information <ul style="list-style-type: none"> Website/information platform Public affairs work and events 	The programme aims to create national Digital Innovation Hubs. A Digital Innovation Hub draws on existing expertise in the country and is formed by existing established players in the field of digitalisation. Institutions with a focus on digitalisation (e.g. universities, COMET centres) or companies can apply to become Hubs and to receive the public	The pilot factories combine basic research, application-oriented research in cooperation with industry, research-oriented teaching and continuing education. The first pilot factory was set up in Vienna. Further pilot factories in Graz and Linz are planned

Name	Base Program	COMET (Competence Centres for Excellent Technologies) programme ⁸	KMU digital ⁹	Digital Innovation Hubs ¹⁰	Pilot factories
	<p>market. The cooperation between science and industry is additionally supported by the program BRIDGE. R & D projects by start-up companies and frontrunner companies as well as the promotion of service innovations (Smart and Digital Services) are also major funding priorities in the base program.</p>		<p>2. Knowledge transfer and qualification</p> <ul style="list-style-type: none"> • A free Online Status Check; providing a quick first status check to identify the digital starting position (“How digital is my company?”) • A free potential analysis (“What shall change?”) • Consulting Services (50% bonus; EUR 1,000 per topic and EUR 4,000 per company maximum) with a focus on a) e-commerce / social media, b) business models and business processes, c) improving IT security (“How should I do it”). • SME digital qualification: digital competences for employers and employees (see under pillar 5) 	<p>funding. Each of these partners provides its expertise and infrastructure and offers a set of measures to support the digitalisation of Austrian SMEs. Digital Innovation Hubs are committed to providing, promoting and delivering a bundle of services in the modules “Information”, “Training” and “Digital Innovation” for the benefit of the SME target group.</p>	

Name	Base Program	COMET (Competence Centres for Excellent Technologies) programme ⁸	KMU digital ⁹	Digital Innovation Hubs ¹⁰	Pilot factories
			<ul style="list-style-type: none"> • “Train and certify the trainer” (for advisers) 		
Granting organisation	<ul style="list-style-type: none"> • Austrian Research Promotion Agency • Federal Ministry of Transport, Innovation and Technology (BMVIT) and the Federal Ministry for Digital and Economic Affairs (BMDW) 	<ul style="list-style-type: none"> • Ministry for Transport, Innovation and Technology (BMVIT) • Ministry for Digital and Economic Affairs (BMDW) • Regions 	<ul style="list-style-type: none"> • Ministry for Digital and Economic Affairs (BMDW) 	<ul style="list-style-type: none"> • Ministry for Digital and Economic Affairs (BMDW) 	<ul style="list-style-type: none"> • Ministry for Transport, Innovation and Technology (BMVIT), the universities where the pilot factories are located (Technical University Vienna, Technical University Graz, and the Kepler University Linz), and participating companies.
Participating organisations	NA	<ul style="list-style-type: none"> • FFG 	<ul style="list-style-type: none"> • Ministry for Digital and Economic Affairs (BMDW) • Austrian Economic Chambers (WKO) 	<ul style="list-style-type: none"> • BMDW, FFG 	<ul style="list-style-type: none"> • Universities and companies.
Sectors targeted	All	All (SMEs, large enterprises, universities, colleges of applied sciences, centres of excellence, research institutions). To apply, a consortium should consist of at least one academic and three company partners.	<ul style="list-style-type: none"> • Trade and industry 	<ul style="list-style-type: none"> • All 	<ul style="list-style-type: none"> • Industry

Name	Base Program	COMET (Competence Centres for Excellent Technologies) programme ⁸	KMU digital ⁹	Digital Innovation Hubs ¹⁰	Pilot factories
Technologies targeted	No specific technologies targeted.	Service innovations, society, information technology, career in research, life sciences, materials and production, mobility, safety, environment and energy, other topics, space.	No specific technologies targeted.	All technologies targeted.	The following Industry 4.0 key technologies were identified: <ul style="list-style-type: none"> • smart electronic based systems • discrete manufacturing • process engineering
Funding (split by private/public and national/EU), state period/annual funding	Around EUR 100 million/ year	Budgets of BMVIT, BMDW and participating regions. Public financing accounts for 45-55% of the overall funding of the programme. The rest is funded by private actors. Between 2015 and 2018, the annual financing budget amounted to EUR 75 million.	Funding through the budget of the BMDW. In 2017 and 2018, the annual funding budget amounted to EUR 3.35 million. The share of public funding was 100%.	The share of public funding provided by BMDW is 100%. In 2018, the funding budget amounts to EUR 3.3 million.	The pilot factories are financed by the Ministry for Transport, Innovation and Technology (BMVIT), the universities where the pilot factories are located (Technical University Vienna, Technical University Graz, and the Kepler University Linz), and participating companies.
Current status of initiatives	Ongoing	In 2018, the programme supported 42 projects that were currently active. The programme is not sector specific.	The programme was launched in 2017 and will expire end of 2018.	The Hubs will be selected in 2019.	Ongoing

Impacts, challenges and perceptions

While the COMET programme has been launched ten years ago, the other initiatives listed above were just recently launched (KMU digital) or have just been announced (Digital Innovation Hub). Especially the latter two initiatives target in particular SMEs, responding to the challenge explained above, i.e. that especially SMEs in Austria lag still behind in terms of digitalisation. Most of the initiatives under Pillar 2 and 3 are bottom-up initiatives handled by the FFG, except for the KMU digital programme.

The uncertainty surrounding digital transformation is still being felt by many SMEs, as a study by Arthur D. Little, Three Business, the WKO and the Institute for SME Management at WU Vienna shows. According to the study, which was conducted for the second time in 2018, 36 percent of the companies surveyed (more than 1100 from seven sectors) stated that missing financial resources were the biggest challenge of the digital transformation. Immediately after, with 35 percent, there is the lack of know-how for implementation. In turn, where it comes to the need for support in the digital transformation, 48 percent of study participants said that they needed advice to implement the digital transformation.¹³ The KMU digital programme which is linked to the government's digitalisation strategy is addressing exactly this need of Austrian SMEs. It was mentioned by one industry association interviewed as the core support programme available in the field of digitalisation. All industry associations interviewed were aware of the COMET programme and considered it very useful for the support of digitalisation in Austria.

The quantitative indicators available show that Austrian companies are catching-up with regard to digitalisation: between 2015 and 2017, the number of Austrian enterprises that use two or more types of social media, sell online, and generating at least 1% of their turnover via these sales, has increased.

It is difficult to causally link this positive development to the concrete initiatives presented above as most of them are still quite recent. However, this trend reflects a general increased level of awareness about digitalisation due to the creation of the industry 4.0 platform in 2015 and the drafting and adoption of the Digital Roadmap in 2016/2017.

The figures also show that Austria is active in funding digital transformation: In 2015, the Austrian ICT spending (as percentage of GDP) was at 3.1%. At the same time, the industry perception of the level of innovation in digital industries remains only slightly elevated in case of non-ICT sectors (2.83 on a scale from 1 to 5, 1 being low and 5 being high) and somewhat elevated in case of ICT sectors (3.67 on a 1-5 scale). In general, some larger companies in Austria are perceived as forerunners that help SMEs to digitalise as well. The usefulness of government support for the digitalisation of companies is considered as somewhat positive (3.67 on a 1-5 scale) by consulted industry associations. The industry associations that participated in this study showed some confidence (3.33 on 1-5 scale) regarding Austria's position in the global competition in e-commerce.

According to industry associations, the key opportunities in Austria related to take up in digital technologies are:

- Increasing efficiency of production;
- Maintaining competitiveness;
- Simplifying and improving administrative procedures;
- Facilitating direct marketing;
- By increasing R&D, supporting the development of new business models; and
- Accompanying SMEs on their way to digitalisation.

Key challenges and barriers in Austria related to take up in digital technologies that are perceived by industry associations are mainly:

- Adapting to constant changes;
- Ensuring adequate qualification;
- The high cost of new technologies, especially for small companies;
The fact that the added value of digital technologies is not always clear for SMEs and that investments in digital technologies do not always seem to be rentable for small companies.

2.2 Regulatory framework for digital age

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

Table 6: Main initiative under Pillar 4

Name	Österreichischer Normungs-Kompass Industrie 4.0 (Austrian Standardisation Roadmap Industry 4.0)	Digitales Amt (Digital authority)	Rat für Robotik und KI (Council for robotics and artificial intelligence)
Type	National working group	Legislative initiative	Counselling body
Starting date	2016	2018	2017
Objective	The initiative aims to raise awareness of the issue of standardisation and provides specific guidance for relevant stakeholders. The initiative is supported by the Austrian Standards Institute (ASI) and the Austrian Association for Electrical Engineering (OVE).	To develop a comprehensive legislative package.	The main objectives are: <ul style="list-style-type: none"> • Raising awareness; • Identifying fields of action and conflict; and • Participating in strategy development.
Short description	The standardisation roadmap provides companies with an overview of standards in the field of digitised production. It is complemented by an online tool that provides detailed and up-to-date information on standards and standards that are highly relevant to Industry 4.0 ("Industry 4.0 Online Catalogue of Standards").	The initiative aims to create a regulatory framework that allows the necessary networking within public administration and thus enables cross-territorial digitisation.	This nine-member body shall primarily advise the BMVIT on the development of the strategy for artificial intelligence and robotics. It shall also discuss, autonomously, essential technological, economic, social and legal issues and to issue recommendations on these. Experts on robotics from research, teaching and business were nominated as members, who discuss the questions together from different angles.
Sectors targeted	Not sector specific	Public administration	Robotics, artificial intelligence

Impacts, challenges and perceptions

Overall, industry associations considered that the regulatory framework has somewhat been made fit for the digital age (3 on a scale from 1 to 5 where 1 is low and 5 is high). However, many initiatives in this field are still under discussion. Last year, the regulatory focus was put on the implementation of the EU General Data Protection Regulation (GDPR). Currently, the national implementation of the NIS directive is under discussion. Asked whether the Austrian authorities have taken specific initiatives e.g. regulatory testbeds to assess the effects of the regulatory climate on innovation and digital transformation, Austrian industry associations come to a mixed conclusion, stating testbeds have been mostly used in the field of research. The perception is that the regulatory framework has been improved, but there are still challenges remaining. Challenges mentioned were:

- New business models emerge which are difficult to include in existing regulatory framework (e.g. shared economy);
- Public authorities and science have to make sure that new availability of data does not endanger the necessity to keep the business secrets of companies;
- There are unclear regulatory issues regarding the market entry for example of drones and autonomous vehicles.

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: Austrian main initiatives to develop digital skills

Name	Fit4Internet	Digital Bootcamps	Schule 4.0 (School 4.0)	Endowed professorship (Stiftungsprofessuren)
Type	Training centres/courses	Financial grants for training	Others	Support for research competence
Starting date	2018	Start: 2018, implementation: 2019	2017	N/A
Objective	To provide basic digital skills for older employees.	To provide applied rapid and in-depth up-skilling of already digitally skilled workers in companies.	To ensure the integration of digital basic education in all Austrian schools by integrating it into curricula and supporting the digitalisation of teaching.	Addressed goals: <ul style="list-style-type: none"> • Development of research competence and capacity in strategically important fields of research • Strengthening human capital • Extending and deepening cooperation relations between science and industry
Short description	Fit4Internet provides courses to spread basic digital skills for employees aged above 45 years. The main instrument used is the issuing of digital competence certificates. The courses focus on basic skills of older employees and workers.	The programme supports the up-skilling of specialists from SMEs in cooperation with a university through a nine-week intensive training courses on topics such as: artificial intelligence, big data, data engineering, blockchain, etc.	The initiative includes 4 pillars: <ul style="list-style-type: none"> • Basic digital education (including media education); • Digitally competent teachers (acquisition of digital skills and digital didactics; training opportunities at educational colleges); • Infrastructure and IT equipment (broadband initiative, expansion of IT infrastructure in schools); and • Digital education media (e-books; Eduthek; game- 	By awarding the "Endowed Professorship", the Federal Ministry of Transport, Innovation and Technology (BMVIT) supports important areas of knowledge for Austria as an innovation location and contributes to the further development of cooperation between science and industry. Endowed professorships are intended to bring outstanding researchers to Austria. The funding period is limited to a maximum of five years and includes the establishment of new topics in the Austrian research landscape.

Name	Fit4Internet	Digital Bootcamps	Schule 4.0 (School 4.0)	Endowed professorship (Stiftungsprofessuren)
			based learning approaches).	
Granting organisation	<ul style="list-style-type: none"> • BMDW • Companies 	<ul style="list-style-type: none"> • BMDW 	<ul style="list-style-type: none"> • Federal Ministry of Education, Science and Research (BMBWF) 	<ul style="list-style-type: none"> • Federal Ministry of Transport, Innovation and Technology (BMVIT)
Participating organisations	<ul style="list-style-type: none"> • BMDW • Companies • Association fit4internet 	<ul style="list-style-type: none"> • BMDW • FFG 	<ul style="list-style-type: none"> • Schools 	<ul style="list-style-type: none"> • N/A
Sectors targeted	All	All	All	All
Funding	Public funding constitutes 80% of total funding. In 2018, the budget amounts to ca. EUR 1 million.	Budget of the BMDW (public), funding per project: max. EUR 500,000	Programme of the national government	N/A
Current status of initiatives	Until the end of 2018, 50 courses are planned to be organised in Austria as part of the programme.	First projects will be implemented in 2019.	A new Master Plan for Digitisation, announced in September 2018, builds on actions under the previous digitalisation strategy, 'School 4.0'. Under the latter various actions have already been implemented: (1) a new subject 'basic digital education' was introduced at lower secondary level this year, (2) a pilot project started in primary school providing an initial programming experience, (3) a modular teacher training on digital skills and digital didactics ('digi.folio') was set up combined with peer learning in 400 schools on the use of tablets while the school development network 'eEducation' was expanded, (4)	N/A

Name	Fit4Internet	Digital Bootcamps	Schule 4.0 (School 4.0)	Endowed professorship (Stiftungsprofessuren)
			<p>teacher training is reinforced through the setting up of 'Education Innovation Centers' as virtual learning areas in teacher training colleges, and (5) digital text books in secondary school became e-books. The new Master Plan for Digitisation in education has three areas of intervention. Under 'Software – pedagogy, teaching and learning content' digitalisation will be introduced into all subject areas and systematically incorporated into revised curricula. Second, infrastructure and availability of mobile end devices is brought up to a unified and comparable standard allowing nationwide use in schools. And, thirdly, under 'Teachers - training and further education', e-content and innovation is systematically introduced into teacher training</p>	

Impacts, challenges and perceptions

The initiatives presented above have all been launched very recently. The Fit4Internet and the Digital Bootcamps initiatives are somewhat complementary: the previous initiative focuses on teaching basic digital skills whereas the latter initiative focuses on training IT experts on the latest technological innovations.

These are only exemplary initiatives. In 2017, the working group of the industry 4.0 platform presented a “result paper”, called “qualification and competences in the industry 4.0”¹⁴. 81 recommendations were developed in seven action areas. These were:

- Combining new and old learning methods;
- Diversity of learning places;
- Promoting access to learning;
- Optimising framework conditions;
- Supporting co-operations;
- Breaking stereotype role models; and
- Pursuing a strategy.

Two out of three industry associations interviewed knew the working group. The usefulness of its work is perceived as very positive, especially that the working group enables a multi-stakeholder dialogue across the division employer/employee and allows for a common strive for setting objectives. However, the political implementation of the proposals made by the working group is seen as a remaining challenge.

Industry associations reported that a high number of their members are faced with a digital skills gap. At the same time, the digital skills of the workforce are only considered having improved to a limited extent since 2015 (2.67 on a scale from 1 to 5). According to the industry associations surveyed as part of this study, only some companies have adopted a general strategy on how to improve digital skills of their employees.

2.4 Support mechanisms

Innovation Voucher

The Innovation Voucher is a funding instrument designed to help small and medium-sized enterprises in Austria to start ongoing research and innovation activities. The Innovation Voucher enables enterprises to enlist the services of research institutions and to pay for these services to a maximum value of EUR 12,500 (80 % funding quota). The Innovation Voucher is designed to encourage SME to co-operate with research institutes. It should make it easier for small and medium-sized companies to overcome inhibition thresholds regarding cooperation with research institutions.¹⁵

Research premium (“Forschungsprämie”)

In Austria, companies can benefit from a tax incentive for R&D (“research premium” – “Forschungsprämie”)¹⁶ for their research and experimental development expenses. They can apply at their financial authority for a reimbursable tax credit, totalling the R&D equivalent to a fixed percentage, currently 14%, of firms’ validated R&D spending. Businesses that do not show

a profit can as well benefit from the research premium. A report from the Austrian Research Promotion Agency (FFG) is a prerequisite.

In 2016, the Austrian government has estimated the increase in the research premium from 10% to 12% to amount to around EUR 100 million Euro. Overall, the research premium is expected to total EUR 627.7 million.

Production of the future¹⁷

This funding project was established in 2011. It was mentioned by one industry association interviewed as one of the most efficient initiatives in Austria to spread digital technologies. It aims to promote funding to improve cooperation between business and science, the development of human resources and the development of research infrastructure. The focus is on competitive production and on increasing productivity to ensure economic growth in Austria. Projects with a particularly high innovation project and an increased risk of development are the main target of the funding.

The most recent call for projects¹⁸, launched between May and September 2018, put one focus on Industry 4.0. Under this funding strand, both industrial research and experimental research on industry 4.0-related topics can be funded. For this whole call, EUR 17.6 million funding are available.

ICT of the future¹⁹

ICT of the Future is a funding programme of the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT). It promotes technology development and innovation in information and communication technology, interlinked with application fields and societal challenges. The target group of the programme includes:

- SMEs;
- Large enterprises;
- Universities;
- Universities of applied sciences;
- Competence centres;
- Research facilities;
- Start-ups;
- Non-profit organisations;
- Regional administrative bodies.

The programme aims to:

- Develop lead technologies;
- Achieve lead positions in competitive markets;
- Establish and extend a lead position as a location for research; and
- Improve the availability of a sufficient number of trained researchers as the backbone of excellent ICT-research and development.

The current, 7th call for proposals under the ICT of the future programme provides funding of more than EUR 7 million.

Smart and Digital Services-Initiative (SDS-I)

The Smart and Digital Services Initiative (SDS-I)²⁰ is an initiative of the Federal Ministry of Digital and Economic Affairs (BMDW). It supports service projects with an R & D character with additional budget resources and is handled by the FFG. The scheme targets small and medium-sized enterprises (SMEs), large enterprises, universities, technical colleges, centres of excellence, research institutions, start-ups and multipliers/intermediaries.

The increased promotion of complex, so-called "smart services" and digitalisation projects is intended to support the productivity, value creation and exports of service companies as well as production companies. Industry 4.0 is one of the focal points of funding. Both manufacturing companies and service providers (logistics, software developer, recycling companies, engineering offices etc.) can be funded if they develop innovative services with R&D character in the context of industry 4.0.

Examples of developments that could be funded are:

- Monitoring systems;
- Simulations;
- Preventive maintenance; and
- Setting up new operating concepts: Contextual, adaptive, use of new technologies such as augmented reality, etc.

Structural Funds

According to the ICT Monitoring Tool²¹, Austria is planning the following ICT Investments under ESIF with relevance to smart manufacturing research and dissemination:

- EAFRD - ICT in rural funds: EUR 27 million
- 044 - Intelligent transport systems (including the introduction of demand management, tolling systems, IT monitoring, control and information systems): EUR 6 million
- 015 - Intelligent Energy Distribution Systems at medium and low voltage levels (including smart grids and ICT systems): EUR 1 million
- 082 - ICT Services and applications for SMEs (including e-Commerce, e-Business and networked business processes), living labs, web entrepreneurs and ICT start-ups): EUR 500,000

This is summing up to a total of EUR 34.5 million.

R & D support

In 2017, 57% of the FFG funding was invested in digitalisation projects. This share has increased from 37% in 2015.

3 Conclusions

The following table provides an overview how the different digitalisation initiatives implemented in Austria 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)
Base Program	EUR 100 million (2018)			
COMET programme	EUR 75 million (2018)			
KMU digital	EUR 3.35 million (2018)			
Digital Innovation Hubs	EUR 3.3 million (2018)			
Pilot Factories	N/A			
Österreichischer Normungs-Kompass Industrie 4.0 (Austrian Standardisation Roadmap Industry 4.0)			N/A	
Digitales Amt (Digital authority)			N/A	
Rat für Robotik und KI (Council for robotics and artificial intelligence)			N/A	
“Learning factory” for Industry 4.0 at the Technical Academy St. Andrä				EUR 20 million (2017)
Fit4Internet				Ca. EUR 1 million (2018)
Digital Bootcamps				Funding per project: max. EUR 500,000
Endowed professorship (Stiftungsprofessuren)				N/A
Innovation Voucher	N/A			
Production of the future	EUR 17.6 million			
Research premium	EUR 627.7 million			
ICT of the future	EUR 7 million			
Smart and Digital Services-Initiative (SDS-I)	N/A			
Structural Funds	EUR 34.5 million.			
R&D funding	N/A			
Total spending	At least EUR 889.45 million (EUR 202.65 million across pillars and EUR 666.8 million under support mechanisms)			

As the results of the DESI index show, Austria performs slightly above EU average with regard to digitalisation, with good results in terms of human capital and digitalisation of public services but

underperforming with regard to the use of internet services. Especially SMEs lag behind in digitalisation.

To support these companies, the Austrian government, together with the Chambers of Commerce, launched a support programme targeting SMEs, the “KMU digital” programme. It is a good practice example of holistic support provided for SMEs, including a potential analysis of how digitalisation could improve the business, concrete consulting in how to implement digitalisation and financial support for training courses to improve digital skills. The “Digital Innovation Hubs” programme also targets SMEs in particular.

Austria cooperates with different European initiatives (Pillar 1 of the DEI), notably as part of the Electronic Components and Systems for European Leadership (ECSEL) initiative and the coordinated plan on artificial intelligence (CAP AI). This cooperation is complemented by bilateral contacts, notably with Germany and the German “Plattform Industrie 4.0”.

Overall, Austria has launched multiple initiatives to boost innovation capacity (Pillars 2 and 3 of the DEI), combining both older initiatives (e.g. COMET programme) and more recent initiatives as the “KMU digital” programme”. In contrast to that, discussions on adapting the regulatory framework to the digital age (Pillar 4) are still at an earlier stage. At the moment, initiatives focus rather on preparing legislative proposals than on their actual implementation. In addition, the regulatory framework seems to be largely set on EU level.

Despite good performance results in terms of digital skills, Austria has intensified its efforts recently to increase both basic and advanced digital skills (Pillar 5). However, these initiatives are recent, so that their real impact cannot be assessed yet.

Taking all that into account, Austria’s national initiatives cover well the different DEI pillars, except for pillar 4 (regulation), where many initiatives are still in the pipeline.

The Digital Roadmap Austria provided a solid basis for the development of follow-up measures, such as the “KMU digital” programme. By creating a new Ministry for Digital and Economic Affairs, the new government, in place since December 2017, showed that digitalisation is one of its political priorities. The multitude of recently launched initiatives under the different pillars can be seen as the implementation of this political priority into concrete actions.

The box below presents a good practice initiative from Austria.

Box 1: Good practice

“KMU digital”

The support programme “KMU digital” was launched in 2017 and targets SMEs. Its main objectives are to provide information and raise awareness on topics related to the digitalisation of economy, including an overview of existing European and national support measures, but also to concretely support Austrian SMEs in digitalising. This concrete support consists among others of company-specific coaching and the funding of training programmes.

Generally, the programme is well known and positively perceived by the industry in Austria. The second biggest challenge regarding the digital transformation of SMEs is the lack of know-

how – right after the lack of financial instruments – which is addressed under the scope of the programme. In 2018, the programme supported 42 projects that were currently active.

To conclude, the table below provides a general overview of the main digitalisation initiatives implemented in Austria, the level of take-up and perception of their impacts as well as the overall progress Austria 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 (start dates in brackets)	COMET programme (2008), Pilot Factories (2016), KMU digital (2017), Digital Innovation Hubs (2018), Base Program (2018)		Austrian Standardisation Roadmap Industry 4.0 (2016), Digital authority (2018), Council for robotics and artificial intelligence (2017)	Fit4Internet (2018), Digital Bootcamps (2018), Schule 4.0 (2017) Endowed professorship (Stiftungsprofessuren)
	Funding (total amount and period)	EUR 181.65 in 2018			EUR 21 million
	Industries addressed	All, Trade & Industry		All	All
	EU programme involved	No		No	No
Usage	Perception of initiative	Government support is considered as rather useful (3.67/5) for digital transformation		The regulatory framework is perceived to be better fit for digitalization than previously	The government initiatives on digital skills are perceived as rather useful (3.5/5)
	Take-up	N/A	N/A		N/A
Outcomes	Perception of outcomes	The level of take-up of digital technologies is perceived as moderate (2.83/5)	The level of innovation in digital industries is perceived as elevated (3.67/5)	The regulatory framework is perceived to be relatively fit for the digital age (3/5)	The required skills and labour resources are considered to be somewhat available to enable digitisation (2.67/5)
	Outcome metrics	DESI ranking on integration of Digital Technology: 10th		Between 2015 and 2017, total capex spending in Austria increased by 12%. In the same period, the number of start-ups increased from 38,636 to 40,127.	The number of people employed with ICT specialist skills increased by 13% between 2015 and 2017. In the same period, the share of enterprises providing training to develop ICT skills fell from 33% (2015) to 31% (2017)
	Change in outcomes	From 2017 to 2018, Austria improved from 12 th to 10 th rank in the DESI ranking on integration of Digital Technology			
	End-goal	Productivity growth	Between 2010 and 2017, the real labour productivity per person employed in Austria increased by 2.5%, with the highest increases in 2016 (0.7%) and 2017 (0.8%).		
Summary	The Austrian industry and government have recently become particularly active in launching initiatives to facilitate the digitalisation of the industry. The initiatives that cover all DEI Pillars and address issues in a comprehensive way have been continually developed throughout the last years. Many of the measures are tailored for SMEs to overcome the digital skill gap and also to boost innovation and competitiveness. Initiatives under Pillar 2&3 and 5 are very positively perceived by the industry, the				

	Pillar 2	Pillar 3	Pillar 4	Pillar 5
	quantitative effects are yet to be seen. The adjustments of the regulatory environment are still under process (Pillar 4).			

ANNEX 1 List of stakeholders interviewed

Type of stakeholder	Name of organisation
Government representative	Federal Ministry for Transport, Innovation and Technology (BMVIT)
Government representative	Federal Ministry for Digital and Economic Affairs (BMDW)
Intermediary	Plattform Industrie 4.0
Industry association	Chambers of Commerce
Industry association	Federation of Austrian Industries
Industry association	Chamber of Agriculture

Endnotes

-
- ¹ European Commission (2018): Country Report Austria 2018, available at: <https://ec.europa.eu/info/sites/info/files/2018-european-semester-country-report-austria-en.pdf>
- ² European Commission (2018): Country Report Austria 2018, available at: <https://ec.europa.eu/info/sites/info/files/2018-european-semester-country-report-austria-en.pdf>
- ³ European Commission (2018): Digital Economy and Society Index 2018, Country Report Austria, available at: http://ec.europa.eu/information_society/newsroom/image/document/2018-20/at-desi_2018-country-profile_eng_B43F6A5A-DBC1-9317-32CB0433D96B5FA6_52212.pdf
- ⁵ Federal Ministry for Digital and Economic Affairs (2018): Digital Roadmap Austria, available at: <https://www.bmdw.gv.at/Digitalisierung/DigitalisierunginderVerwaltung/Seiten/Digital-Roadmap-Austria.aspx>
- ⁶ European Commission (2018): Country Report Austria 2018, available at: <https://ec.europa.eu/info/sites/info/files/2018-european-semester-country-report-austria-en.pdf>
- ⁷ Smart Specialisation Platform, Austria. Available at: <http://s3platform.jrc.ec.europa.eu/regions/at>
- ⁸ FFG, COMET Competence Centers for Excellent Technologies. Available at: <https://www.ffg.at/programme/comet-competence-centers-excellent-technologies>
- ⁹ WKO, KMU digital. Available at: <https://www.wko.at/Content.Node/kampagnen/KMU-digital/index.html>
- ¹⁰ FFG, Digital innovation hubs. Available at: <https://www.ffg.at/dih>
- ¹¹ FFG, COMET Competence Centers for Excellent Technologies. Available at: <https://www.ffg.at/programme/comet-competence-centers-excellent-technologies>
- ¹² WKO, KMU digital. Available at: <https://www.wko.at/Content.Node/kampagnen/KMU-digital/index.html?shorturl=kmudigitalat>
- ¹³ ¹³ <https://diepresse.com/unternehmen/digitalaward/5541533/KMUDigital-hilft-bei-der-Transformation>
- ¹⁴ Industrie 4.0 österreich (2018). Ergebnispapier « qualifikation und kompetenzen un der industrie 4.0 ». Available at: http://plattformindustrie40.at/wp-content/uploads/2018/05/WEB_Industrie4.0_Ergebnispapier_2018.pdf
- ¹⁵ FFG, Strengthening Austria as a location for research and innovation. Available at: <https://www.ffg.at/en/programme/innovation-voucher>
- ¹⁶ Unternehmensservice portal, Forschungsprämie. Available at : https://www.usp.gv.at/Portal.Node/usp/public/content/steuern_und_finanzen/betriebseinnahmen_und_ausgaben/49867.html
- ¹⁷ FFG, Produktion der Zukunft – die FTI Initiative und Ihre Ausschreibungen. Available at: <https://www.ffg.at/produktion-der-zukunft>
- ¹⁸ FFG, Produktion der Zukunft - 28. Ausschreibung, national. Available at: <https://www.ffg.at/28-ausschreibung-produktion-der-zukunft>
- ¹⁹ FFG, IKT der Zukunft – das Förderprogramm. Available at: <https://www.ffg.at/iktderzukunft>
- ²⁰ FFG, Smart and Digital Services-Initiative (SDS-I). Available at: <https://www.ffg.at/programme/smart-and-digital-services>
- ²¹ Smart Specialisation Platform, ICT Monitoring - Planned ICT Investments under ESIF. Available at: <http://s3platform.jrc.ec.europa.eu/ict-monitoring>