



Digital Transformation Monitor

# Czech Republic: “Průmysl 4.0”

*May 2017*





© LD Prod/Shutterstock.com

# Czech Republic: “Průmysl 4.0”



## Fact box for Czech Republic's Průmysl 4.0 policy initiative

 <b>Policy Lever(s)</b>	Bottom-up approach, public financing, orientation towards skills.
 <b>Funding Model</b>	Funding model based on already existing Operation Programmes of the involved ministries and the Technological Agency of the Czech Republic.
 <b>Target audience(s)</b>	Policy makers, private sector, R&D organisations, industry associations, academia.
 <b>Concepts &amp; Focus Areas</b>	Timely response to the market and industry changes by creating a flexible education system, adapting the labour market and regulatory framework.
 <b>Key drivers</b>	Active involvement of the policy makers from key Ministries, representatives from industry, business, research and education.
 <b>Key barriers</b>	Reluctance to change, insufficient knowledge of Industry 4.0, deficient coverage of broadband connection in some regions.
 <b>Implementation strategy</b>	A team of experts involved in the creation of the Action Plans, dissemination activities and awareness raising already in place.
 <b>Results achieved</b>	No results available, the initiative is still in the early stage of implementation.
 <b>Budget</b>	No extra budget earmarked for the purposes of this initiative.
 <b>Uniqueness factor</b>	Addressing the topic as an overall societal challenge rather than focusing solely on industry. Multidisciplinary approach actively involving key stakeholders.
 <b>Value-added for policy-makers</b>	Active cooperation with stakeholders throughout the entire process facilitates identification of needs, expectation and feedback through a bottom-up approach.
 <b>Expected Impact</b>	Maintaining and boosting the competitiveness of the Czech Republic.

Source: Digital Transformation Monitor

## National strategy with a strong multidisciplinary approach

Průmysl 4.0 (Industry 4.0) is a national initiative aiming to maintain and enhance the competitiveness of the Czech Republic in the wake of the Fourth Industrial Revolution. The concept was firstly presented during the 57th International Engineering Fair in Brno, September 2015 and approved by the Government of the Czech Republic on 24th August 2016. The Ministry of Industry and Trade plays a key role in the implementation process, however, there is a strong interdisciplinary cooperation between the ministries, social and industrial partners and academia.

The goal is to prepare not only the industry but the whole society for the economic and societal changes related to the fourth industrial revolution. P40 has a wide focus on the creation of business and social environment, in which the Czech economy can reach its full potential. At the same, the initiative aims to mobilise private sector, R&D and industry associations, and academia to actively participate in the implementation process.

There is no time frame set, the goal is to create a consistent framework enabling all the parties involved to adapt to new market conditions. No extra budget has been earmarked for the P40, the Government is planning to use already existing financial tools, e.g. Operational Programmes.

## Close cooperation with stakeholders

The Czech Republic has one of the highest shares of industrial production per GDP among EU countries (approximately 32% GDP). Furthermore, the country has strong industrial ties to Germany, which is its strategic business partner<sup>1</sup>. Czech companies mainly supply industrial components to its neighbouring country, thus integrating into the German industrial supply chain. Next to being a reaction to the German 'Industrie 4.0' initiative, P40 also seeks to counteract the often fragmented and misleading portrayal of I40 by correctly describing the concept as well as its impact on society.

The initiative is based on the state-of-art analysis carried out by a team of experts from industry, academic and research communities called the Core Team Průmysl 4.0. The team is led by professor Mařík from the Czech Institute of Informatics, Robotics and Cybernetics. The document analyses the 4<sup>th</sup> industrial revolution, in particular regarding the technological prerequisites and vision of P40, its requirements concerning applied research and standardisation. It also investigates the impact on the labour market, education system and regulatory framework.

The Ministry of Industry and Trade established a coordination platform Alliance Society 4.0 bringing together experts and policy makers to prepare an action plan for the implementation

of P40 taking into consideration the current Czech Action Plan on Digital Market Development. The action plan will be finalised by the end of June 2017 and presented to the Government.

## Objectives of the policy

The initiative represents the national strategy developing the vision of a fully digital economy towards the real cyber revolution within the Czech Republic. The conceptual proposal is based on data and information collected by the experts and provides recommendations for next steps in several areas. The focus is on building data and communication infrastructure, the adaptation of the education system, introduction of new tools in the labour market, adaptation of the social environment and fiscal help for the companies related to the introduction of new technologies and know-how.

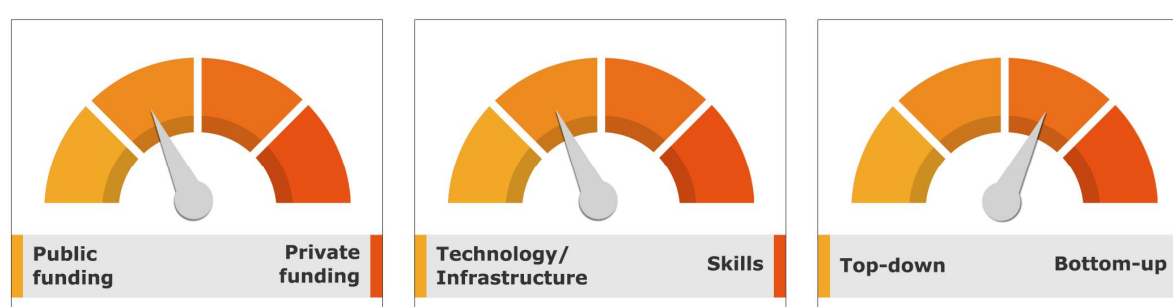
There are three main objectives:

Firstly, to enhance the ability of Czech companies to be involved in the global supply chain.

Secondly, the implementation of the Industry 4.0 principles will lead to more efficient manufacturing, meaning faster, cheaper and resource-effective production.

Thirdly, to enhance the cooperation with R&D and industry association, universities and Academy of Sciences of the Czech Republic for the development of software solutions, patents, production lines and export know-how.

### Policy levers for Czech Republic's Průmysl 4.0



Source: Digital Transformation Monitor

## A multidisciplinary, bottom-up approach

The Ministry of Industry and Trade has a steering position, however, the key stakeholders are actively involved in the preparation of the national strategy and are now working on the Action Plan guiding the implementation of the initiative. The involvement of the experts from the social, business, scientific, industrial and academic communities ensures that the actions address the actual needs of the represented sectors. The multidisciplinary approach requires close cooperation between policy makers from different sectors. Digitalising the industry is perceived as a continuous bottom-up process, driven by companies to increase their competitive advantages.

So far, no extra budget has been earmarked for the implementation of the initiative. The Operational Programmes already in place will be used to finance projects related to P40. The role of the state is to create a good business environment and define a clear innovation policy with an efficient funding model rather than just provide direct financial support. The key instrument for coming years is OP PIK (Operational Program Enterprise and Innovation). However, it is necessary to explore the options for the involvement of private funding, e.g. Venture capital, a combination of credit and subsidies, revolving finance. The Ministry of Industry and Trade perceives the ability of companies to invest in innovative solutions is crucial.

The Czech Republic foresees the changing needs on the labour market, which together with the already noticeable lack of technically skilled workforce in some of the engineering fields place the education system on the top priorities. The skills orientation

*“Industry 4.0 is a way to maintain our competitiveness.”*

**Jan Mládek, Minister of Industry and Trade**

is prevailing over the technology deployment, stressing the important role of adaptation of the educational and social system on rapid change on the labour market.

## Public financing via existing Operational Programmes

Public funding is based on the financial tools already in place. The Operational Programmes and subsidy programmes of the ministries and the Technical Agency are available to support P40 related projects.

The Government is currently looking into making changes to investment law for the benefit of the initiative. The financial resources allocated in the OP PIK (€4.5 billion) administered by the Ministry of Industry and Trade already offers several suitable programmes to support P40 activities.

Several programmes focus on the promotion and funding of scientific activities and the building of partnerships between the business sphere and R&D organisations, e.g. *Potenciál* (Potential), *Aplikace* (Application), *Partnerství znalostního transferu* (Knowledge transfer partnership), *Proof of Concept* for commercialisation of the research results. *Služby infrastruktury* (Infrastructure Services) and *Spolupráce* (Cooperation) support development of the clusters, technology platforms, cooperation networks, innovation centres and incubators.

The programme *Pro-Commercial Public Procurement* provides funds and subsidies for innovative solutions for the public sector. Business entities can benefit from the programme *ICT a sdílené služby* (ICT and shared services) providing financial aid to support data centre operation and development of software or *Inovační vouchery* (Innovation vouchers) for obtaining know-how.

The Operational Programme OP VVV (Ministry of Education, Youth and Sports) and the Operational Programme OP Z (Ministry of Social Affairs) are planned to finance the activities related to the education and social system.

## Exploring the potential sources of financing

The national innovation fund (€1.87 million) brings together financial resources from the European Structural and Investment Funds, OP PIK and additional €1.2 million from the private sector and it is considered as a possible source of a refundable form of financial support, of which part would be reinvested in the new projects.

Further programmes Trio (€140 million), Gama and Epsilon administered by the MPO are considered as other options of the funding for the realisation of the P40 activities. These programmes aim to improve knowledge transfer between the industry and R&D institutions.

At this stage, no model for private financing is in place. The Government is planning to explore different possibilities.

## Focus on skills and applied research

The national initiative is based on explicit analysis of the current situation in the Czech republic underlining the strategic focus areas. At this stage, only indicative actions and measures are available, showing possible directions for further development.

The main focus lies on skills, the adaptation of the education system as well as implications on the labour market. A reform of the education system at all levels towards the promotion of technical disciplines is being prepared in cooperation with the Ministry of Education, Youth and Sports.



Next to a mandatory graduation in mathematics, these changes equally focus on gaining practical experience through internships. At university level, the emphasis is put on the interdisciplinary programmes combining technical and non-technical competencies. Further adjustments will address requalification and lifelong learning aspects, given that some professions are likely to disappear in the fourth industrial revolution.

A comprehensive action plan Vzdělávání 4.0 (Education 4.0) is being prepared administrated by the Ministry of Education, Youth and Sports.

Regarding the research and development, P40 proposes to build a system of Applied Research Centres on the national level investing public funds and financial contribution of the industry.

This system will provide national research and development infrastructure with a strong innovative potential which would be responsible for the technological support for the realisation of P40 objectives.

The system should be based on the example of Fraunhofer, Europe’s largest application-oriented research organisation. The main focus of the centres includes exploitation of the applied research results in manufacturing, manufacturing and services, export of technology licencing and software solutions, development and commercialisation of new technologies and prototypes.

Within the main activities will be also strengthening the cooperation with test-beds and private sector on the realisation of challenging research projects providing the solutions for industry needs. Already existing R&D organisations will be effectively incorporated in this proposed system.

Several programmes fund eligible projects related to P40. Collaborative projects of business and R&D organisations based on the development of the innovation networks, clusters, technological

platforms and other cooperation networks are funded up to €600,000 in form of subsidies. Similarly, projects prepared in cooperation with R&D and business organisations focusing on innovative solutions and innovative products for global markets can be funded up to 70% of eligible costs (max. €3.8 million).

**Target audience:**

P40 is a call for action urging all stakeholders to play an active role in the implementation process. The Ministry of Industry and Trade requested a cooperation of crucial policy makers including the Ministry of Education, Youth and Sports, Ministry of Finance, Ministry of Labour and

Social Affairs, Ministry of Transport, Ministry of Interior, the Office for technology Standards, Metrology and Testing are gradually involved. The Moravian Chamber of Trade Unions , the Czech Chamber of Commerce, the Czech confederation of Industry, Universities, CzechInvest (Innovation and Development Agency) are actively participating in the preparation of the Action Plan. The initiative targets not only policy makers but also the academia, research, business and industry associations.

Companies, professional associations and unions play a pivotal role in identifying actual needs of the industry and helping to create a suitable legislative framework to facilitate the transformation and to reduce the bureaucratic burden for all parties involved.

**Concepts and focus areas – economic and social environment**

The main goal is to create an appropriate business and social environment with the main focus on building the data and communication infrastructure, adaptation of education system, introducing new labour market instruments and creating financial policy supporting companies with investment in the new technologies and know-how. At this stage, there is no more specific information available. The Action Plan for P40 which is being prepared at the moment will provide more detailed information on the specific focus areas.

SWOT Matrix for Průmysl 4.0	
<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>• Cooperation with other ministries, multidisciplinary approach</li> <li>• Involvement of the stakeholders in all stages of the process</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• No clear model for private financing</li> <li>• Incomplete high-speed internet coverage</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Addressing the Industry 4.0 as a national priority rather than individual actions</li> <li>• Creating a more flexible education system in line with labour market needs</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Gap between industry needs and qualifications</li> <li>• Standardisation and cyber security is not in line with global standards</li> </ul>

*Source: Digital Transformation Monitor*

## Key drivers

Through its long industrial tradition and strong ties to Germany - perceived as a pioneer in Industry 4.0 in Europe - the Czech Republic has a good starting position in the field.

In addition, the active involvement of key stakeholders in the whole process from the identification of main challenges and needs to the preparation and implementation of the Action Plan increases the added value of P40.

The Czech Confederation of Industries set up six working groups to deal with the implementation of P40 in the field of education, R&D, government agenda, the private sector, social dialogue and cooperation.

## Raising awareness about Průmysl 4.0

The Czech Confederation of Industry, CzechInvest (Investment and Business Development Agency) and other business associations launched a number of dissemination activities to raise awareness concerning P40.

'Industry 4.0 in practice' is a series of events taking place in regions bringing together the private sector, business and industry association, R&D organisations and representatives from the universities to inform on the opportunities, threats and Industry 4.0 in general. The events also aim at obtaining feedback and recommendations.

## Implementation Strategy & Approach

The national initiative Průmysl 4.0 was approved by the Government in August 2016. The action plan is in the drafting stage and therefore not available for the moment.

In January 2017, the Government established the Alliance Society 4.0 as a coordination platform working on the Action Plan ("Society 4.0"). The platform was established under the Digital Coordinator of the Czech Digital Agenda, established by the Government Office. The platform brings together economic and social partners, representatives from the academic and scientific communities, experts from private and public sectors.

The Action Plan Society 4.0 is an effective implementation of several agendas related to Průmysl 4.0 in order to coordinate activities of individual ministries and other relevant governmental bodies.

Moreover, the Alliance is also developing a system of information and feedback in public administration to promote and disseminate the implication of the fourth industrial revolution.

Simultaneously, this is an opportunity to inform and educate the general public about the topic and related changes.

Society 4.0 will include in particular new approaches in the field of new technologies, industry, manufacturing and services, energy, healthcare, Smart Cities, regional development, eGovernment, broadband infrastructure, the Internet of Things and Services etc.

Implementation of new technologies in these areas and overall digitalisation on all levels require a special attention on cyber-security to be included in the Action Plan.

Similarly, the strategy will address the necessary modifications linked to the labour market, education, R&D, fiscal and monetary policy. The Alliance is structured into strategic, managerial and working and coordination level.

## Implementation barriers

In terms of barriers to the implementation of P40, two main aspects were identified. So far a positive development of the Czech industry leads to a reluctance to change, even though it is only short term perspective. The fourth industrial revolution cannot be stopped and its implications are irreversible.

Furthermore, the society is not completely familiar with the concept of Industry 4.0 and the misleading, insufficient knowledge about the subject is reinforcing the reluctance to change.

### Targeted and/or achieved results for Průmysl 4.0

<b>Supported SMEs and mid-caps</b>	<ul style="list-style-type: none"> <li>N/A at this stage</li> </ul>
<b>Regional involvement</b>	<ul style="list-style-type: none"> <li>Dissemination activities carried out in all the regions in form of events with an informative character, open discussion proving the feedback from SMEs and different stakeholders.</li> </ul>
<b>Showcase projects</b>	<ul style="list-style-type: none"> <li>N/A at this stage</li> </ul>
<b>Network of experts</b>	<ul style="list-style-type: none"> <li>90 experts working on a proposal of a national initiative</li> <li>Alliance 4.0 - group of experts is preparing an action plan for the implementation of the policy</li> </ul>

Source: Digital Transformation Monitor

There is a deficient coverage of the broadband connection in some of the regions in the Czech Republic. A high-speed broadband connection across the whole country is a necessary condition for the smooth implementation of the P40.

It is perceived as a highly prioritised task in order to create an appropriate business environment and public funding has already been allocated in the programme High-speed internet within the OP PIK for this purpose.

## Results achieved / expected

At this stage, there are no results available. The main goal of the initiative is to create a business and social environment enabling all the Czech companies to sooner or later adapt on the changes and seize the new business opportunities arising from the fourth industrial revolution.

As a response to the P40 and overall emerging industrial revolution, some of the universities, especially with the technical orientation, such as the Czech Technical university in Prague, VŠB - Technical University of Ostrava, University of technology in Brno) have already started to prepare and offer new study programmes, which better reflect the changing market needs.

## Scalability and transferability

The broad focus and close cooperation of experts and governmental bodies offer significant potential to scale-up at the national level.

P40 is based on the complex analysis of the business and social environment in the Czech Republic. It is a small, open and highly industrialised economy. Historically a long tradition in the industry and high share of industrial manufacture on the Czech economy put the country into a specific position, and the Czech path will most likely differ from the other countries, as history proved in the case of previous industrial revolution.

Thus, the transferability and replication potential is limited. Moreover, each country has different socio-economic and industrial patterns, as well as different historical development.

However, there is a common interest in some areas and overall concept and some elements rather than policy as a whole could be transferable.

A complex interdisciplinary understanding of the implication of the fourth industrial revolution could be used as an inspiration for reproduction of the similar multidisciplinary approach.

## References

<sup>1</sup> <http://www.spcr.cz/images/priloha001-2.pdf>

<sup>2</sup> <http://www.businessinfo.cz/cs/clanky/vladimir-marik-ceska-republika-muze-na-industry-40-hodne-vydelat-73668.html>

<sup>3</sup> <https://www.mpo.cz/cz/prumysl/zpracovatelstsky-prumysl/prumysl-4-0-ma-v-cesku-sve-misto--176055/>

<sup>4</sup> <http://www.businessinfo.cz/cs/clanky/jan-mladek-prumysl-40-je-cestou-k-udrzeni-nasi-konkurenceschopnosti-75605.html>

<sup>5</sup> <http://www.refernet.cz/en/news/ostatni/experts-ntf-participated-preparation-national-initiative-industry-40>

<sup>6</sup> <http://docplayer.cz/18736658-Iniciativa-prumysl-4-0-je-reakci-na-klicove-vyzvy-formuluje-cile-a-reseni-pro-propojeny-prumysl.html>



## About the Digital Transformation Monitor

The Digital Transformation Monitor aims to foster the knowledge base on the state of play and evolution of digital transformation in Europe. The site provides a monitoring mechanism to examine key trends in digital transformation. It offers a unique insight into statistics and initiatives to support digital transformation, as well as reports on key industrial and technological opportunities, challenges and policy initiatives related to digital transformation.

Web page: <https://ec.europa.eu/growth/tools-databases/dem/>

---

This report was prepared for the European Commission, Directorate-General Internal Market, Industry, Entrepreneurship and SMEs; Directorate F: Innovation and Advanced Manufacturing; Unit F/3 KETs, Digital Manufacturing and Interoperability by the consortium composed of PwC, CARSA, IDATE and ESN, under the contract Digital Entrepreneurship Monitor (EASME/COSME/2014/004)

Authors: Demetrius Klitou, Johannes Conrads & Morten Rasmussen, CARSA and Laurent Probst & Bertrand Pedersen, PwC

---

*DISCLAIMER – The information and views set out in this publication are those of the author(s) and should not be considered as the official opinions or statements of the European Commission. The Commission does not guarantee the accuracy of the data included in this publication. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which might be made of the information contained in this publication. © 2017 – European Union. All rights reserved.*