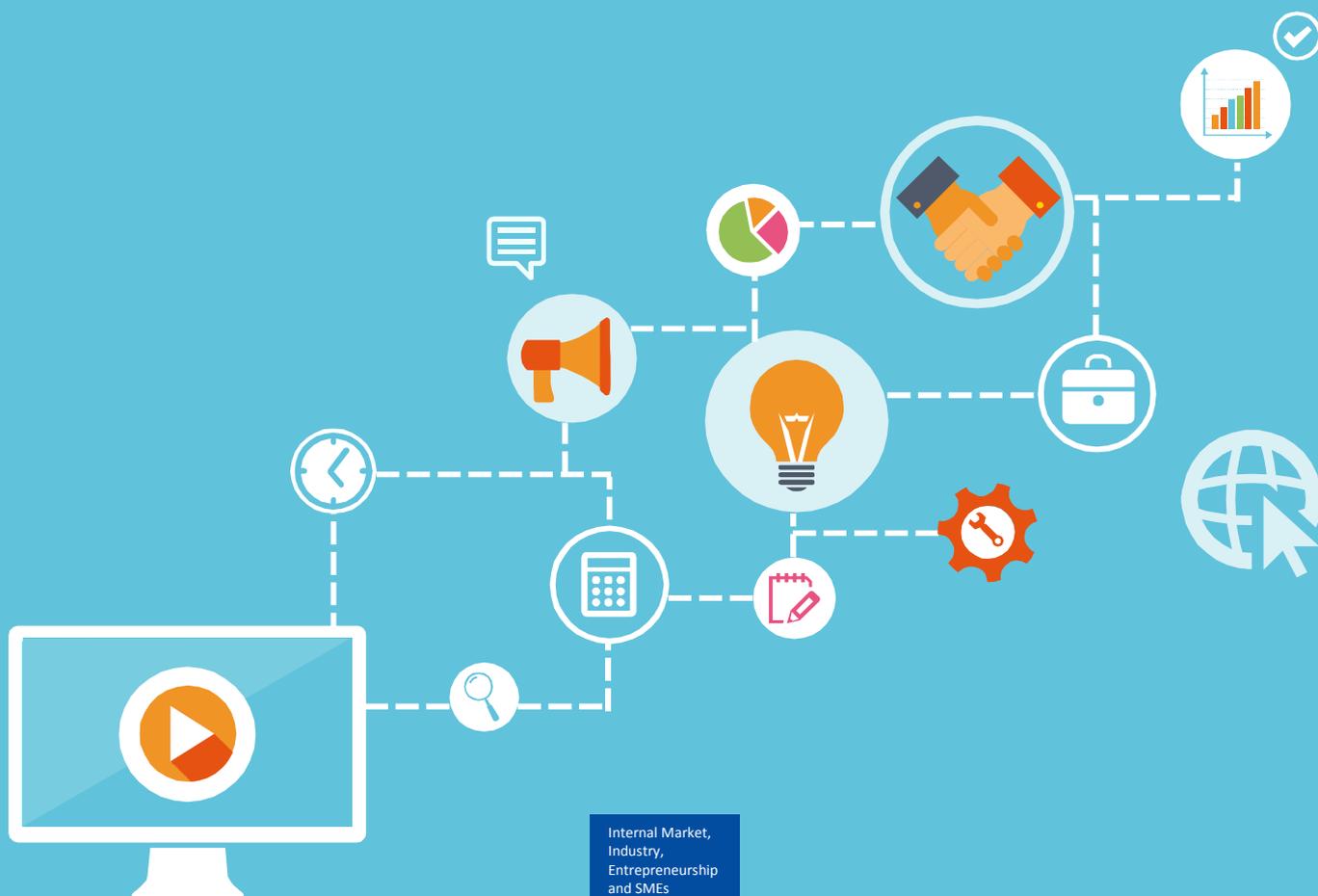




Digital Transformation Monitor

# Hungary: "IPAR 4.0 National Technology Platform"

*December 2017*



Internal Market,  
Industry,  
Entrepreneurship  
and SMEs



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# Hungary: “IPAR 4.0 National Technology Platform”

## Fact box for Hungary’s Industry 4.0 National Technology Platform policy initiative

 <b>Policy Lever(s)</b>	Bottom-up approach, public financing, equally orientated towards technology and infrastructure and skills.
 <b>Funding Model</b>	Simple public funding model under negotiations, a possibility to secure private financing through introduction of membership fees.
 <b>Target audience(s)</b>	Policy makers, private sector, R&D organisations, industry associations, universities, social circles, business.
 <b>Concepts &amp; Focus Areas</b>	Implementation of the knowledge-economy elements of sectoral industrial strategies.
 <b>Key drivers</b>	Emergence of a new technological era in which the Internet-based economy transforms the very basics of the production and logistics systems.
 <b>Key barriers</b>	Smooth implementation process, crucial to give an emphasis to the involvement of key stakeholders.
 <b>Implementation strategy</b>	Driven by industry and backed up by government to ensure the widest outreach possible.
 <b>Results achieved</b>	Development of a strategic policy paper on the future of Industry 4.0 in Hungary.
 <b>Budget</b>	Operated by the voluntary work contributions of the Institute for Computer Science and Control of the Hungarian Academy of Sciences (MTA SZTAKI). Negotiations on obtaining financing from the Ministry for National Economy are in progress.
 <b>Uniqueness factor</b>	Multidisciplinary approach involving stakeholders coming from key industry, academia, social and business backgrounds.
 <b>Value-added for policy-makers</b>	Cooperation and partnership facilitation, both at national and international level, throughout the entire process of implementation; driven by industry.
 <b>Expected Impact</b>	Boosting manufacturing and industry transformation in Hungary in the wake of the Fourth Industrial Revolution.

Source: Digital Transformation Monitor

## Building bridges between the physical and digital world

“I4.0 NTP” (Industry 4.0 National Technology Platform) is a national strategic initiative from the Hungarian Academy of Sciences Institute for Computer Science and Control (MTA SZTAKI) and the Ministry for National Economy. The general objective of the platform is to boost manufacturing and industry transformation in Hungary in the wake of the Fourth Industrial Revolution.

The initiative is based on the “Irinnyi Plan”, the recent strategy for re-industrialisation of Hungary of the Ministry for National Economy. Aiming to support the objectives of this strategy, I4.0 NTP was successfully launched in the spring of 2016.

There is no specific timeframe set for the I4.0 NTP, however, the expected impact is to (1) prepare the industrial sector for, and adapt it to the requirements of I4.0 innovation, and (2) reinforce achievements in the global competitiveness of industry attained by the country.

According to industry stakeholders, the platform is an important element in improving the country’s readiness for digital transformation. To date, a comprehensive and coherent policy paper on the future prospects of I4.0 in Hungary represents the platform’s major achievement.

Forward-looking, I4.0 NTP aims to further increase its activities and pilot several I4.0 systems across the country.

## National blueprint for re-industrialisation of the country

Similarly to other European countries, Hungary, has entered a new technological era. In this era, the Internet-based economy significantly transforms the very basics of production and logistic systems. The theoretical and practical problems emerging from such a change are of a great complexity making Hungary a rather modest performer in digital transformation.

In particular, digital infrastructure is the major challenge to overcome with 38 % disparity compared to the EU average<sup>1</sup>. Furthermore, Hungary scores less than 10% below the EU average in investments and access to finance, and supply and demand of digital skills<sup>2</sup>.

An effective digital restructuring of Hungarian industry has a great potential to significantly contribute to the improvement of the situation in the country. In addition, it could help to boost the international competitiveness of production and enhance conditions for job creation.

Against this background, the Hungarian government and industry identified a need for developing a comprehensive policy strategy pushing forward digital transformation.

As a result, Mihály Varga, the Minister of National Economy introduced the “Irinnyi Plan” in February 2016. The plan outlines the main directions of innovative industrial development in Hungary. The plan foresees to transform the country into one of the

EU countries with the most highly developed industrial sectors by 2020. More specifically, the main objectives of the plan are:

- (1) increase the industrial output-to-GDP ratio from the current 23.5% to 30% until 2020;
- (2) increase the level of R&D expenditures to 1.8% of the GDP by 2020;
- (3) reinforce the growth, export and innovation potential of the domestic companies;
- (4) decrease standardised low-skill activities;
- (5) increase high-skill activities, embracing planning, control and IT-related tasks<sup>3</sup>;

The funding for the implementation of the plan is partially earmarked from Hungary’s EU funds and partially from the state’s budget.

## Ensuring industry readiness for future manufacturing

I4.0 NTP is part of the national strategy as defined in the “Irinnyi Plan”. The plan seeks to fundamentally re-arrange the manufacturing systems based on digital modelling.

There are five primary objectives of the I4.0 NTP:

- (1) foster information exchange, cooperation and partnership establishment between all actors of the economy, with a special regard given to Hungarian research and education institutions, companies

### Policy levers for Hungary’s IPAR 4.0 National Technology Platform



Source: Digital Transformation Monitor

and professional associations;

(2) work towards the acceleration of innovation, particularly in the key areas of digitisation and production, with a specific sector focus on cybersecurity;

(3) support the readiness of the national economy for innovative adaptation;

(4) respond to challenges in a prompter way than any time before.

(5) foster bold steps towards innovation.

## Driven by industry, backed by the state

The policy levers of the platform include an initial design phase, a visionary and a top-down steering role by the Ministry for National Economy in the form of strategy development.

To ensure the success of the platform in the long-term, emphasis is put on the substantial involvement of the private sector. Their feedback was collected through targeted surveys serving to identify future priorities and actions for Hungary's digital transformation. Therefore, the idea development was chiefly carried out by representatives coming from industry, academia and social circles, but in close collaboration with the Hungarian Government. A leadership role of the platform, including its management and administration, has been entrusted to the Hungarian institute MTA SZTAKI for an indefinite period of time.

I4.0 NTP is based on a holistic approach that almost equally addresses technology and infrastructure on the one hand and skills on the other. The main aim is to replicate the German "Industrie 4.0" initiative in Hungary. The expected results include: innovation acceleration, realisation of industrial solutions, a new generation of trained and highly-qualified professionals and the development of a sustainable and competitive manufacturing ecosystem in Hungary.

The platform is fully supported by the Hungarian Government and operated

by the voluntary work contribution of the MTA SZTAKI. Negotiations on obtaining financing from the Ministry for National Economy are ongoing.

I4.0 NTP is strongly related to the wider Centre of Excellence in Production Informatics and Control (2017-2024) (EPIC CoE) project which was awarded an EU grant under the Horizon2020 initiative<sup>4</sup>. In addition, the EPIC CoE is further supported by substantial financial subsidies provided by the National Research, Development and Innovation Office of the Government of Hungary (NRDI) and the Economic Development and Innovation Operational Programme (GINOP).

## A balance between public and private financial mechanisms

There is a simple public funding model behind I4.0 NTP comprising a planned state budget support (under negotiations), with the option to introduce a membership fee (not yet decided).

For the EPIC project, the Horizon2020 grant of more than €10.8 million (around HUF 3.26 billion) awarded through the Horizon 2020 framework programme serves as the project's key financial instrument.<sup>5</sup> Major financial contributions were also made by the NRDI Office (€3.6 million) and GINOP<sup>6</sup>.

The entire budget of the EPIC CoE, including voluntary in-kind contributions from participating stakeholders accounts for €21.7 million (HUF 6.5 billion)<sup>7</sup>.

## Exploring the potential sources of private financing

Private companies' participation in the development and funding of the Industry 4.0-related measures is considered vital for their lasting success. However, due to the early stage of I4.0 NTP, no secure model for ensuring private financing is in place, with the government predominantly securing public funding for continuous running of the platform. The only

private financing available is in form of voluntary in-kind contributions from stakeholders; yet, only few contributions have been received to this point.

For this reason, MTA SZTAKI is currently exploring possibilities for ensuring private financing lastingly. Based on its design and diverse membership, a membership fee is currently discussed as an option for the future.

## Organised around seven I4.0 Working Groups

Following the re-industrialisation strategy of the European Union, the Hungarian Government has placed the industrial and manufacturing sector in the focus of its economic development strategy.

To fulfil its mission as defined in the Organisational and Operational Regulations<sup>8</sup>, I4.0 NTP work is strategically structured around seven Working Groups that were established in October 2016 during the second Plenary Meeting of the Platform. The activities of the individual groups target specific issues of the Industry 4.0 in Hungary. They aim to find solutions and formulate recommendations on how to overcome the challenges presented by the practice. The seven Working Groups are:

1. Strategic Planning
2. Employment, Education and Training
3. Production and Logistics
4. ICT Technologies
5. Industry 4.0 Cyber-Physical Pilot Systems
6. Innovation and Business Model
7. Legal Framework

Forward-looking, maximising the activity of individual Working Groups remains a major challenge for the platform.

The organisational structure of the platform includes Members, a Presidium and a Secretariat. The Presidium has seven members, including President, Permanent Member and five Representatives coming from different sectors of production, informatics, SMEs, institutions of higher education; and professional organisations. The Secretariat has currently only two members who primarily execute a supporting role for the platform.

### Targeting industry representatives at large

Building on Hungary's hitherto achievements in increasing global competitiveness, I4.0 NTP urges all relevant industry stakeholders to play an active role in the implementation process.

Therefore, stakeholders from policy, research, social, industry and professional domains are well represented in the platform and mutually contribute to the I4.0 platform as well as the wider I4.0 programme.

### Concepts and focus areas – “re-industrialising the national economy”

The platform is presented as a common and strategic vision for the re-industrialisation of the Hungarian economy.

The central role of I4.0 NTP is to draft and propose suggestions and policy recommendations for the Government thus serving as its Advisory Body.

A particular focus is given to the most pressing issues of the country's economy, including digital production and the Internet of Things (IoT).

### Increasing global competitiveness of the national economy

There are several key drivers which have supported the implementation of I4.0 NTP until now. Primarily, the impetus given to the initiative by the Hungarian Government to re-industrialise its economy plays a vital role. Following up on Germany's Industrie 4.0 advanced initiative, the Hungarian Government worked on adapting it to the specific needs of Hungary-based companies while adding unique features and elements of their own.

Further enabling factors for the implementation of the initiative include the effective cooperation between MTA SZTAKI and the Ministry for National Economy at both, personal and organisational level. Mr István Lepsényi, Secretary of State for Economy Development and Regulation of the Ministry for National Economy, formerly played a key management role in Hungarian industrial companies.

### Support received from German and Austrian institutions

For long, Hungary was observing the political, economic and social scene in Germany and in the neighbouring Austria. Both Hungary and the scientific community in the country (the Faculty of Mechanical Engineering and the Faculty of Transportation Engineering and Vehicle Engineering of the Budapest University of Technology and Economics), have established very good ties with flagship German and Austrian organisations. These include the Fraunhofer Institute for Manufacturing Engineering and Automation, Fraunhofer Institute for Production Technology, Fraunhofer Institute for Production Systems and Design Technology and the Fraunhofer Austria Research.

#### SWOT Matrix for Industry 4.0 National Technology Platform

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• State as driving force securing substantial financial backing</li> <li>• Broad involvement of private sector in deployment and maintenance of the I4.0 NTP</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• No model for securing private financing established</li> <li>• Broadly defined objectives of the platform</li> </ul>
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Establishment of new partnerships between industry, research, academia and social institutions, both at the national as well as international level</li> <li>• Transferability potential for less industrialised European countries</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>• An uneven activity among individual Working Groups</li> <li>• Not transferable across highly industrialised Western European countries</li> </ul>

Source: Digital Transformation Monitor

The Hungarian consortia supported by the leading German and Austrian Institutes, won a major EU grant for the establishment of the EPIC CoE. The centre is coordinated by the National Innovation Office in Hungary. Its main goal is to enhance the applied research and innovation potential in the field of cyber-physical systems in Hungary, with international influence, especially in the Central Eastern European region. In connection with the objectives of the EPIC CoE, I4.0 NTP was developed.

### Fostering cooperation and partnership building

Nearly 40 representatives of prestigious Hungarian companies, universities and other academic circles were invited to become the Founding Members of the platform by signing the Deed of Foundation. This public-private cooperation and partnership established between the key entities representing industry has been particularly indispensable throughout the implementation phase of the platform.

Three months after the launch of I4.0 NTP another 25 companies expressed interest and joined the platform. Currently, the platform has more than 100 participants and continues to be open to new memberships<sup>9</sup>. New applications are being progressively evaluated by the Special Committee that makes the final decision on their admission.

### Smooth implementation

According to the implementation body of the initiative, MTA SZTAKI, there have not been any major obstacles or barriers encountered along the way since the launch of the platform.

Crucial, however, was to ensure a well-balanced representation and involvement of all relevant stakeholders covering the key Industry 4.0 sectors in Hungary.

Thanks to an effective communication strategy implemented by the Hungarian Government, core industry representatives were able to express their interest in the initiative at a relatively early stage. As a result, industry was able to actively contribute to and shape the I4.0 NTP implementation process.

### Young, yet results-driven

The platform has been running for approximately 1.5 years, which makes it difficult to fully assess the achieved results. Despite the initiative’s young age, a lot has happened in a relatively short timeframe.

To increase the effectiveness of the Working Groups, the I4.0 NTP has developed the Industry 4.0 INFO@HAND application. It is an easy-to-use tool enabling stakeholders to access all relevant information related to the work of the platform directly on their smart phone.

Moreover, the platform has brought together stakeholders from different sectors (e.g. manufacturing and ICT) and also of different business sizes

(e.g. large and small). Before the launch of the I4.0 NTP, smaller and larger industrial companies are reported to have cooperated less regularly. Mandated by the Hungarian Government, the platform successfully developed and presented a comprehensive and coherent policy paper. The strategic document focuses on the future I4.0 industry development plan for Hungary.

Regarding expected results, there is a plan for initiation of several Industry 4.0 pilot systems across the country.

Here, a leverage effect is expected by bringing together Hungarian companies to cooperate within different Working Groups of the platform. Pilots are planned to be set up predominantly in industrial firms, allowing all companies to express interest in participating.

Until late 2017, MTA SZTAKI also expects to increase the activity level of the Working Groups by speeding up their internal work.

*“We are witnessing the advent of the era of a new technological change, when the internet based economy is transforming the very basics of the production systems.”*

**István Lepsényi, Secretary of State for Economy Development and Regulation, Ministry for National Economy**

Targeted and/or achieved results for Industry 4.0 National Technology Platform	
<b>Private sector involvement</b>	<ul style="list-style-type: none"> <li>100 experts identified as active members of the platform divided into seven core Working Groups.</li> </ul>
<b>Bringing together different sectors</b>	<ul style="list-style-type: none"> <li>Stakeholders from different sectors are brought together to advise and make recommendations on the future of I4.0 in Hungary.</li> </ul>
<b>Policy strategy</b>	<ul style="list-style-type: none"> <li>Creation of a strategic policy development plan responding to Industry 4.0 challenges faced by Hungary.</li> </ul>
<b>I4.0 piloting</b>	<ul style="list-style-type: none"> <li>Preparatory work undertaken for the initiation of I4.0 pilot systems across the country to be launched in autumn 2017.</li> </ul>

Source: Digital Transformation Monitor

## Showcasing transferability potential

Most European countries have already started to replicate the highly advanced German model of industrialisation. Initiatives from less industrialised countries, including Hungary, however, also offer certain unique features with transferability potential.

In fact, according to MTA SZTAKI, the platform is a model for replication in other EU countries. More specifically, in Central and Eastern European countries (e.g. Poland, Slovakia), Balkan countries (e.g. Croatia, Slovenia) and some less industrialised Western countries (e.g. Portugal). In this regard, the NRD Office plans to organise a regional conference in autumn 2017 inviting speakers from neighbouring countries.

The platform does however not serve as a model for highly industrialised countries such as Germany or France.

## Lessons learned

There are two main lessons learned regarding the success of the platform.

Firstly, it is important to continue to strengthen the activities as well as the presence of the platform in the Hungarian economy.

Secondly, the success of activities of the platform can be largely attributed to a good and fruitful cooperation between the Hungarian Ministry, NRD Office, MTA SZTAKI and in support of all members of the platform.

The primary lessons learned from implementing the platform concern the following:

- (1) the management of the platform is more time consuming than originally estimated. The workload is challenging and the number of memberships keeps increasing;
- (2) a more active involvement of the Working Groups within the platform. Their activities, recommendations, results and propositions are of vital importance to the successful fulfilment of the mission of the platform.

## References

<sup>1</sup>Digital Transformation Scoreboard 2017: Evidence of positive outcomes and current opportunities for EU businesses (2017)

<sup>2</sup>Ibid.

<sup>3</sup>Irinyi Plan: The Directions of Innovative Industrial Development in Hungary, February 2016, <http://www.kormany.hu/download/b/f/b/31000/IRINYI%20Plan.pdf>

<sup>4</sup><https://www.centre-epic.eu/?q=node/49>

<sup>5</sup><https://www.sztaki.hu/en/science/news/two-hungarian-research-initiatives-among-ten-european-excellence-programmes-selected>

<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

<sup>8</sup>Ibid.

<sup>9</sup><https://www.sztaki.hu/en>



## 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/>

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