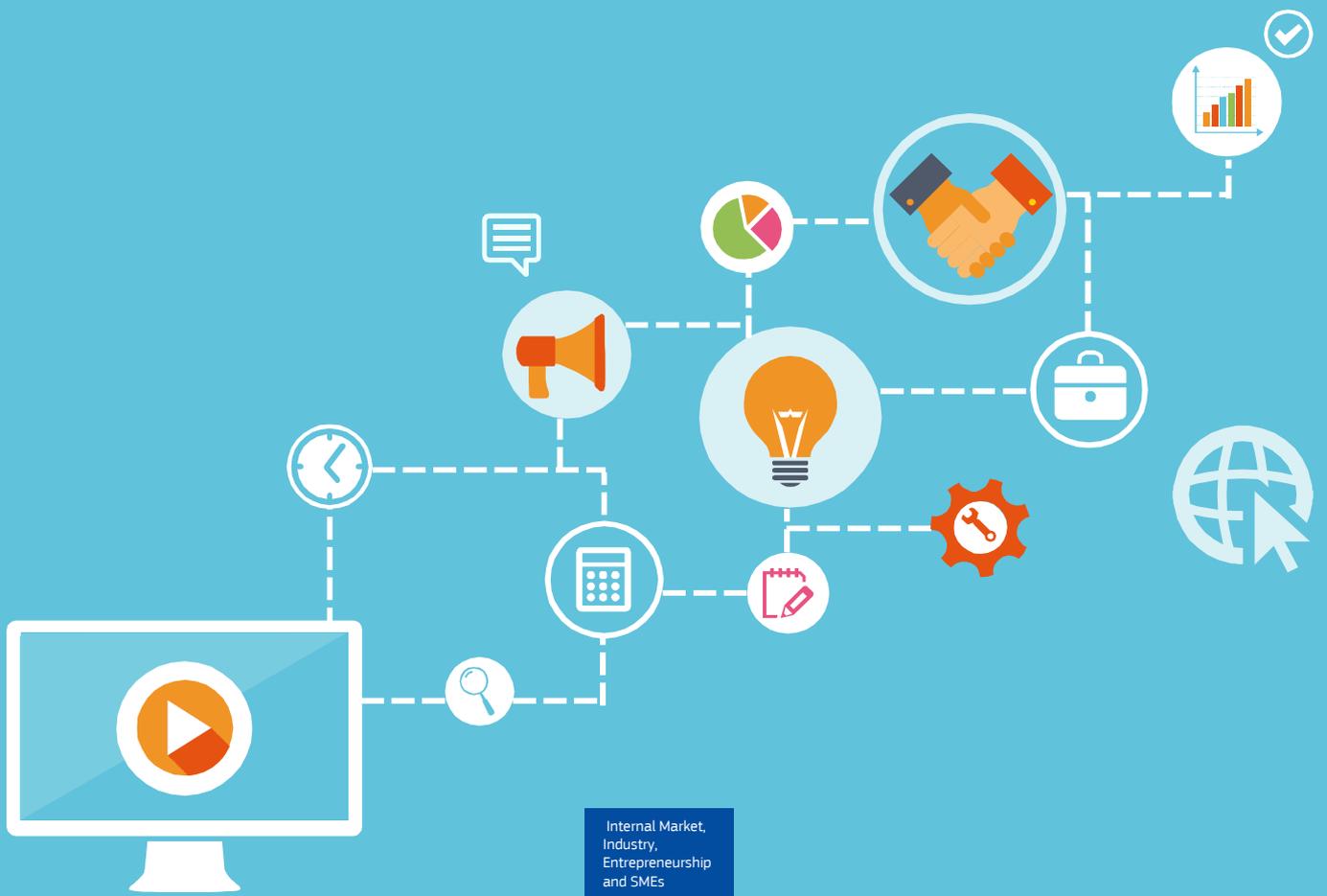




Digital Transformation Monitor

# Country: Portugal “Indústria 4.0”

May 2017





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# Country: Portugal “INDÚSTRIA 4.0”

## Fact box for Portugal’s Indústria 4.0 policy initiative

 <b>Policy Lever(s)</b>	Bottom-up design and implementation; Strong focus on upskilling human capital with weaker focus on new technologies; Equally funded by public and private sector.
 <b>Funding Model</b>	No specific funding scheme available; a mix of funding instruments will be used (loans, tax aid, private investment)
 <b>Target audience(s)</b>	SMEs
 <b>Concepts &amp; Focus Areas</b>	Indústria 4.0 supports the development of skills, new methods and digital applications in key strategic sectors of the Portuguese economy
 <b>Key drivers</b>	Functional governance model, with a private company managing the implementation tool. Realistic identification of industry needs.
 <b>Key barriers</b>	Lack of methods to ensure private investment; social fear that massive digital transformation could lead to unemployment.
 <b>Implementation strategy</b>	Implemented by private actors through an online platform; Constant review and adjustments of the measures.
 <b>Expected results</b>	Impact over 50,000 companies and train 200,000 workers on digital competences.
 <b>Budget</b>	EUR 4.5 billion over 4 years.
 <b>Uniqueness factor</b>	Private implementation, tailored measures to the needs of industry with regular updates. Online platform, no physical office. Involvement of multinational companies during the design and implementation of the various measures.
 <b>Value-added for policy-makers</b>	Indústria 4.0 platform facilitates the implementation and cooperation between relevant actors. Its bottom-up approach and flexibility can be a model for replication.
 <b>Expected Impact</b>	Position Portugal as an international key player by providing the tools to upgrade the Portuguese industry, train the workforce, and attract investment.

Source: Digital Transformation Monitor

## Shifting gears to become a key player of the 4<sup>th</sup> Industrial Revolution

Indústria 4.0 is the Portuguese strategy to develop industry in the digital area. Launched In January 2017, the aim is to put Portugal at the forefront of the 4<sup>th</sup> Industrial Revolution by focusing on 3 axes: digitalisation, innovation and training.

Concentrated on identifying the real needs of the Portuguese industry, with a particular focus on SMEs as drivers of change, 120 Portuguese companies participated in the design of the strategy. During the next 4 years 60 public and private funded measures will be implemented. The measures are divided in 6 strategic pillars: human capital qualification; technological cooperation; start-up i4.0; financing and investment incentive; internationalisation; and standards and regulation.

Following a bottom-up approach used for its design, the implementation of Indústria 4.0 will be conducted through a platform launched by the Ministry of Economy but managed by COTEC - a private company. COTEC will also be in charge of updating the initiative, which will serve to adapt its content to the quick evolution of needs.

Needs-oriented and with a strong support and involvement of the private sector, in particular multinational groups, Indústria 4.0 expects to have an impact in over 50.000 companies and train over 20.000 workers.

Due to its early implementation stage, it is difficult to analyse the outcomes. The lack of mechanisms to assure private investment and leverage, as well as social apprehension over job losses are among the major challenges the initiative is currently facing.

Originally focused on 4 key sectors, the Government is currently working on following the same design approach to develop other sectors of the economy such as “media and content” and fintech.

### Government support to overcome obstacles

The 2016 Digital Economy & Society Index from the European Commission highlighted Portugal’s good performance in relation to the EU average. Portugal has the infrastructures and the innovation capacity needed to take a lead in the fourth industrial revolution. Nevertheless, digital skills have been identified as one of its weaknesses. Altogether, Portugal is faced with the challenge of effectively applying its skills<sup>1</sup>.

The Portuguese government has been deeply involved in overcoming its internal market scale and peripheral location obstacles in order to develop the digital transformation of its industry. For the first time, the geographical location of Portugal will not be a burden for its positioning as a leading industrial country.

In 2016 the Ministry of Economy started a process to get a reliable and realistic overview and diagnosis for digital transformation in order to develop a National Digital Strategy.

During 10 months the government worked with over 200 companies in different working groups, which represented different strategic sectors (agroindustry, retail, tourism and automotive). This process involved for the first time multinational companies such as Alitice- PT, Bosch, Deloitte, Google, Huawei, Microsoft, Siemens or Volkswagen.

The dialogue between companies, employees, associations, science and political actors allowed all economic operators to gain a uniform understanding of the potential of Industry 4.0. During the working groups the actors shared their experiences, analysed the identified problems and proposed solutions, resulting in the design of ambitious but achievable recommendations for the Portuguese industry.

### Objectives for digital and skills transformation

The Indústria 4.0 initiative was presented as a strategy to overcome competitiveness challenges and prepare the Portuguese Industry for the 4<sup>th</sup> industrial revolution.

The government underpinned through talks with relevant stakeholders the urgency to raise awareness about digital transformation and the necessity for requalified the human capital.

Overall, 3 main objectives are targeted by the initiative. Firstly, it aims to provide the Portuguese industrial fabric with the knowledge, information and tools needed to transform, adapt and empower its national workforce.

#### Policy levers for Portugal’s Indústria 4.0



Source: Digital Transformation Monitor

The strategy also aims to create favourable conditions for the development of i4.0 start-ups as well as, national technological solutions in an international context.

Finally, the initiative plans to position Portugal as an international HUB by attracting resources and creating fiscal and legal conditions to attract foreign investors.

## A public-private partnership with human capital focus

The design of the strategy focused on the involvement of the private sectors as a vehicle to assure the success of its implementation. The execution of the initiative relies on an equal distribution of private and public funded measures. Nevertheless, a part of the allocated private investment is eligible for public co-investment via the Portugal 2020 strategy.

Originally, Indústria 4.0 is based on a comprehensive approach addressing to the same extent technology and skills, with 24 measures and 22 measures respectively. Yet, the government has highlighted the importance of skills development and multinational companies are actively involved in the implementation of initiatives addressing requalification of human capital, as well as new digital applications skills.

The design of the strategy relies on a bottom-up approach involving and engaging with industry, scientific and education stakeholders, in order to determine the needs and potentials of the industry.

*"It is not a State strategy, nor is it from Government. It is a strategy of the country. This concerns the digitalization of industry" -*

**Joao Vasconcelos, Secretary of State for Industry**

The practical implementation of Indústria 4.0 is equally undertaken on the basis of a bottom-up approach. The management of the implantation platform, the follow-up and monitoring of the measures is done by the private consultancy COTEC. In addition, a strategic committee made up of multinational companies and relevant stakeholders guides and advises the government board regarding the evolution of the strategy content.

## Portugal 2020 ERDF funds

The funding model combines public and private funding. Overall, an investment of €4.5 billion has been budgeted for the next 4 years. Public funding of the measures will be made available through Portugal 2020 ERDF funds.

A total of €2.26 billion will be allocated for the adoption of technology and infrastructures linked to the concept of Indústria 4.0. Different financial tools will be used (loans, tax deductions, call for proposals or vouchers). For instance, through the financial instrument "vale Indústria 4.0" the government will invest over 12 million euros distributed in vouchers of 7.500€ each to support SMEs' digital transformation.<sup>2</sup> In addition, a credit line will also be launched in order to support export activities.

## Success is conditioned on private financing

The government relies on private investment to carry out half of the measures under Indústria 4.0.

Private companies participation in the development and funding of the measures is considered a key factor for the success of the initiative. Due to the early stage of Indústria 4.0, no assessment is available yet on the private leverage ration of public funds or on the mechanisms applied to ensure private financing.

The implementation of the 60 measures will be gradual over the 4 years. It is not yet possible to quantify the total amount of private funds.

Nonetheless, some private funds have already been compromised. Regarding technological cooperation, Bosch plans to invest in partnership with Minho University €54.7 million up to 2018 in a lab for advanced additive manufacturing. A further €19 million will be invested in partnership with Aveiro University for the development of solutions for smart houses and equipment related to digitalisation. In addition, PSA Mangualde in Consortium with 3 universities and 5 technological partners will invest €12 million.

## 6 strategic pillars and 10 flagship initiatives

Indústria 4.0 is structured around 6 strategic pillars: human qualification, technological cooperation, start-up i4.0, financing and investment incentives, internationalisation and standards and regulation.

The first pillar emphasises the need for a requalified labour force. One of the priorities in this regard is to adapt the education system in order to match industry future needs by integrating digital skills in the education curriculum. At the same time, there is a need to encourage employees training and enhance continuous training through extra-curricular activities. Through the Digital Skills Programme the Government aims to train 20.000 people in ICT skills by 2020.

Through technological cooperation, Indústria 4.0 seeks to promote cooperation among the technological suppliers, the scientific community and industry. Altogether, 24 measures will be implemented to stimulate industry innovation encouraging the development of partnerships.

The third pillar, includes 4 measures focusing on boosting Portugal's role as a start-up centre to drive innovation drivers, while ensuring that the required conditions to position Portugal as an attractive hub are met. The tourism sector is particularly targeted in the this pillar. A further 4 measures have been defined to assure the digitalisation and renovation of the industry.

The fifth pillar plans to position Portugal as an attractive location for industry and investors, while supporting SME internationalisation.

Finally, the standards and regulation pillar intends to foster the involvement of industry to identify the readiness of Portuguese regulation regarding standards.

Furthermore, 10 flagship measures will represent the essence of Indústria 4.0: Finance, Digital Skills Programme, i4.0 technical courses, Learning Factories, International Missions, Adira Industry 4.0, Future 2020, Bosch Digital, 4AC Indústria 4.0 and PSA Manguade Consortium.

### SMEs at the heart of the measures

Indústria was designed to focus on the needs of SMEs. From the selection of the sectors examined, to the predominance of SMEs' participation in all working groups, the plan aimed to ensure SME readiness to lead the 4<sup>th</sup> industrial revolution and boost the Portuguese economy. As a result, most of the measures target specifically SMEs. There is also an emphasis on strengthening partnerships between, SMEs, multinationals, startups and educational institutions.

### Focusing on 4 key strategic sectors

The initiative's central theme is to provide SMEs and industrial companies with the knowledge and resources to drive the digital transformation,

Four focal sectors were considered due to their impact on the national economy: automotive, fashion & retail, agro-industry and tourism. The initiative highlights measures that will enable the transformation of these sectors.

What is more, special attention to the training of human resources – at young age and as life long learning – is employed as a way to prepare a new generation for new jobs. The initiative also prioritises the retraining of workers as well as the creation of new jobs.

### The central role of the private sector

Behind the design of the strategy lies the government's interest to tackle the country specific challenges. The process followed intended to provide a complete and realistic view of the industrial enterprise needs. The involvement and engagement of different stakeholders representing the whole value chain has been of vital importance to develop a comprehensive and realistic strategy.

Indeed, Indústria 4.0 has managed to bring on board relevant stakeholders representing the whole value chain of four key sectors for the Portuguese economy. The engagement of all economic operators, in particular multinational companies, allowed to pursue an innovative work process that facilitated the dialogue around the technological characteristics of the fourth industrial revolution. This support has been repeated during the implementation phase, since these actors are playing a central role in steering activities and applying private measures.

Indústria 4.0 represents a high level policy priority and the engagement of different ministries has been reflected during the design and implementation process.

The use of a digital platform for the management and implementation of Indústria 4.0 ensures that all the actors are well connected, while facilitating the application and management of the measures.

### Feedback information from the ground to propose realistic measures

From a policy design perspective, a bottom-up approach was decided to be the best method to address the most pertinent problems of industry.

In a first phase, a kick off meeting set up the strategy and guidelines to follow, including an overview of other similar European programmes already in place. The process took place during a period of 10 months, and included consultations with over 80 individuals that helped to underpin needs, constraints and opportunities. Several workshops to validate the outcomes, auditions with sectoral organisations and strategic committee meetings took place during this period. The result was the presentation of 60 specific measures divided in 6 strategic pillars and the launch of "Plataforma i4.0" as the initiative's implementation tool.

SWOT Matrix for Indústria 4.0

<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>Tailored to the needs of the Portuguese industry due to its bottom-up approach.</li> <li>Online platform and governance model boosting flexibility and adaptability</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>Lack of mechanisms to ensure private funding.</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>Transferability and scalability of the methodology to other sectors and countries.</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>Social rejection of measures motivated by fears of increasing unemployment.</li> </ul>

Source: Digital Transformation Monitor

## Functional governance model

The Platform i4.0 is the main tool used to ensure the effective implementation of the initiative. The platform will guarantee awareness raising and dissemination activities of measures and initiatives. At the same time it will act as an interface to facilitate interaction between stakeholders and as a repository of knowledge and information. This is entitle to simplify the monitoring and assessment of the implemented measures, as well as facilitate the creation of new working groups to envisage future scale ups or replications of the initiative.<sup>3</sup>

For the first time in Portuguese history the government handed over the implementation and management of the actions to a private body. A cooperation protocol was signed between the Ministry of Economy and COTEC, ensuring a functional governance model. This approach was decided taking into account the rapid evolution of the digital context and the need to move swiftly.

The 60 measures will be implemented gradually through the 4-year plans.

## Social impact of massive digital transformation

Due to the infant stage of the initiative's implementation, only few barriers have been identified.

The digital transformation that the companies need to undertake can lead, if not address correctly, to an increase of unemployment rates. Therefore, Indústria 4.0 launched a core component of its strategy the need to prepare the new and current generation for the skills that will be needed in future jobs.

Another barrier relates to the lack of mechanisms applied to ensure private financing. Although private stakeholders and in particular multinationals have been actively involved, no instrument has been developed to ensure private funding commitments.

## Targeted results

With the first measures implemented in February 2017, quantitative results have not yet been assessed by COTEC. Nevertheless, a high degree of interest and awareness regarding the initiative has been observed.

Overall, Indústria 4.0 expects to raise awareness about digital transformation needs of the industry and gain knowledge concerning future needs. It also aims to increase companies' competitiveness in the industrial market and support its development in international markets. Finally, the target is to become an interesting country for international investment.

In particular, Indústria 4.0 aims to have an impact over 50.000 companies and train 200.000 workers on digital competences.

## 2 new sectors under investigation

Although Indústria 4.0 is not the first nor the last initiative addressing the challenges and opportunities of the 4<sup>th</sup> industrial revolution, efforts have been made to create a model addressing the specific needs and proposing targeted solutions in order to position Portugal as a key player in the digital transformation.

The initiative's bottom up approach - applied during the design and the implementation - can be transferable to other sectors or countries. Stakeholders engagement has proven to be of crucial importance to the development and final outcome of the initiative.

The approach followed to develop Indústria 4.0 is currently being used to identify the needs and propose measures to boost two new sectors. The media and content sector has a great potential to create added value in the digital economy. Another sector currently in study to scale up the

### Targeted results for Indústria 4.0

<b>Supported SMEs and mid-caps</b>	<ul style="list-style-type: none"> <li>Support 1.500 SMEs digital transformation through voucher.</li> <li>Impact over 500.000 companies.</li> </ul>
<b>Leading role</b>	<ul style="list-style-type: none"> <li>Overcome barriers and take a predominant role in the international sphere regarding 4<sup>th</sup> Industrial revolution.</li> </ul>
<b>Awareness-raising</b>	<ul style="list-style-type: none"> <li>SME's awareness regarding the need of digital transformation.</li> </ul>
<b>Skill development</b>	<ul style="list-style-type: none"> <li>200.000 workers to be train on ICT skills.</li> </ul>

Source: Digital Transformation Monitor

method used for this initiative is fintech (finance service and technologies), as blockchain and new payment platforms open a wide range of possibilities for the development of digital platforms<sup>4</sup>. This provides further evidence for the transferability potential of the methodology and approach followed.

Other relevant sectors for the Portuguese economy, will likely follow a similar approach in order to ensure their readiness for the 4<sup>th</sup> industrial revolution.

## Key role of multinational groups and stakeholders

Given the early phase of implementation, it is too early to identify key lessons learned from the initiative. Nonetheless, the engagement of the private sector, in particular of multinational groups is considered to be of strategic importance for the success of the identified measures.

## References

- <sup>1</sup> Indústria 4.0 Action Plan.
- <sup>2</sup> <http://www.portugal.gov.pt/pt/ministerios/meco/noticias/20170130-mecon-industria-4.aspx>
- <sup>3</sup> <http://www.industria4-0.cotec.pt/#iniciativa>
- <sup>4</sup> Deloitte press dossier regarding Indústria 4.0  
<https://www2.deloitte.com/pt/pt/pages/consumer-industrial-products/articles/industria-4-0-.html>



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## 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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