National strategies on Artificial Intelligence
A European perspective in 2019

Country report – Portugal

In June 2019, the Portuguese government presented its national AI strategy entitled AI Portugal 2030 (Portugal, 2019). It is setting out the challenges and opportunities of a rapidly growing AI ecosystem in Portugal. It presents a strategic vision for the upcoming years to foster and consolidate the use and development of AI in the public and private sector. Given that people constitute the main engine for the successful deployment of AI, the outlined strategy concentrates its action lines along the notions of inclusion, education, qualification, specialisation and research.

The national AI strategy of Portugal does not disclose financial provisions or estimations for its implementation.

1 Human capital

One of the main objectives outlined in the strategy relates to human development and in particular to the enablement and reinforcement of the population to the challenges and priorities that AI technologies bring along. This is achieved in the strategy based on three of its main axes: increasing the overall level of education in AI, upgrading the qualifications of the labour force and foster specialisation in AI-related fields.

Regarding education, the strategy emphases the importance to prepare future generations for a digital and AI society. This can be reached through a well-developed education infrastructure providing the necessary basis for education in AI including training to younger students and to higher qualification levels such as bachelors, masters, post-graduates and PhDs. Finally, continuous support to encourage students’ interest and specialisation in computer and data science in particular and STEM subjects in general is needed to create a highly skilled and qualified labour force in computer science, engineering and AI related areas.

Specific actions related to reforms of the education system in AI include among others:

- Teaching young students the fundamentals of machine learning, through the Ciência Viva Clubs initiative;
- Developing programming/coding capabilities and creativity capabilities for problem solving;
- Creating a teaching programs in AI at each level of education;
- Development of graduate specialisation programmes (MSc and PhD) for executive education for adults.

In terms of qualification and specialisation, the strategy targets a more skilled labour force by means of AI and data science (re)skilling qualification programmes. Increasing the stock of active population with digital and AI skills is primordial to meet the upcoming demands of employment in AI. The strategy provides particular attention to support actions that increase the digital and science competences in the public sector.

Specific actions to develop qualification programmes for reskilling and upskilling the population to meet market demands and lifelong learning initiatives include:

- Creation of Regional/local Networks for Digital Qualification for reskilling and upskilling adult training;
- Creation of qualification vouchers and lifelong learning opportunities;
- E-learning courses on AI and specific application domains;
- Reinforcing already existing AI and data science skill qualification programmes in public sector.
2 From the lab to the market

The objective of support actions from the lab to the market all aim to the development of an AI knowledge-intensive research and innovation ecosystem. It comprises support actions towards the creation of a community of young, vibrant, knowledge-intensive AI companies able to develop cutting-edge technologies in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI. To this purpose, the Portuguese strategy proposes policy initiatives to reinforce the research and innovation potential in AI.

Actions outlined in the strategy to establish a strong research and innovation ecosystem include among others:

- Support for application based and fundamental research;
- Participation to the development of a Centre of excellence for AI R&D;
- Promotion of new and innovative solutions for administrative simplification in the public sector (SIMPLEX program);
- Launch of Innovation funding programmes;
- Creation of sandboxes and testing facilities;
- Refinement of the innovation voucher instrument;
- Reinforcement of the national structure for funding management and identify KPI for investment evaluation.

Besides these support actions, the Portuguese strategy highlights the importance of promoting research and innovation in specific scientific areas. Priority sectors that will be promoted as "living labs" for new experimentation in AI are:

- AI for urban transformation (sustainable cities);
- AI for sustainable energy networks;
- AI for biodiversity (green and blue economy);
- AI for autonomous driving;
- AI for cybersecurity;
- Quantum materials for AI;
- Adaptive learning curricula for students.

Specialised services based on AI applications will include:

- Natural Language Processing (for automatic translation and other automatable services);
- Real time AI (for securing business and financial transactions);
- AI for software development;
- AI for edge-computing.

Other policy initiatives not explicitly mentioned in the AI strategy report, may contribute to the creation of a vibrant enterprise ecosystem in Portugal, such as incentive systems for technological R&D in companies, Startup Portugal, Incubation vouchers, Industry 4.0 National Strategy, among others.

Policy actions towards advanced use and deployment of AI in the public administration include among others, LabX – aiming to create a culture of experimentation and innovation in the public sector –, and InnoLabs to share good practices across the public administration.

3 Networking

There is a widespread consensus that AI will profoundly transform our world and will provide powerful solutions to the current challenges we are facing nowadays. The opportunities offered by AI are ambitious. To fully leverage these ambitions, a collaborative and networking approach is essential. The Portuguese strategy proposes a wide range of support actions to forge partnerships across both public and private institutional players. The strategy advocates that joint undertakings should not only be restricted within Portugal, but should include European-wide and international collaborations.

Support actions to increase networking and collaborations include:

- Extension of collaborative laboratories (Colabs) and Digital Innovation Hubs (DIHs) (e.g. current DIHs in Portugal are: Produtech (production technologies), iMan Norte Hub (manufacturing) and HUB4AGRI (agriculture);
- Increase partnerships with other Member States through joint participations on electronic components and systems (ECESEL), high-performance computing (EuroHPC), and the Quantum Flagship (H2020);
- Fostering of long-term collaboration between academia and companies through framework contracts and data/technology sharing platforms;
- Participation in European Networks, European AI excellence centres and other European DIHs (e.g. DIH on cybersecurity at Leon or the DIH on IoT in Salamanca).
Besides networking support, the strategy provides ample attention to instruments that **promote the national and international attractiveness of AI** in Portugal by means of dissemination campaigns. Dissemination campaigns are essential to ensure digital inclusion by informing the whole population about the benefits of AI technologies. International campaigns in turn aim to attract international AI and ICT talents to study and work in Portugal. Hence, support actions to promote the national and international attractiveness of AI include:

- Promote the attractiveness of Portugal to foreign talent, including students, researchers and experienced professionals, and reduce border obstacles;
- Spread the awareness about AI and technology in the whole of the population.

### 4 Regulation

The emergence and expanding use of AI is driving regulatory efforts to come up with a framework and guidelines on how to develop and use AI technologies. **Legal, regulatory and ethical frameworks** are essential for the development of standards in artificial intelligence regarding issues of transparency, accountability, liability and ownership. In terms of regulation, the Portuguese strategy proposes the following actions:

- Creation of an ethical committee for AI and Automation to define and deploy guidelines for ethical-by-design AI;
- Support for the development of a legal and regulatory framework, to determine among others liability issues in case of conflicts due the involvement of AI decision making;
- Support should be given to companies and regulators to find appropriate legal frameworks.

### 5 Infrastructure

In terms of infrastructure to enable the development of AI technologies, the Portuguese strategy proposes following support actions:

- The creation of a National Data Infrastructure (a centralised repository for administrative data). This action fits in the same line as the Open Data Policy of the Portuguese Foundation for Science and Technology (**FCT**) providing guidelines for managing and sharing data in the scientific community;
- The establishment of supercomputing and quantum computing facilities. In this respect, the Portuguese government has developed the Advanced Computing Portugal 2030 strategy to define objectives for the creation of high-performance computing in Portugal.

### 6 Update

The outlined strategy will be annually reviewed and updated by the Portuguese national funding agency for science, research and technology.

### Reference

Background information

This country report has been prepared in the context of AI Watch and the OECD AI Policy Observatory.

AI Watch is the European Commission knowledge service to monitor the development, uptake and impact of Artificial Intelligence (AI) for Europe, launched in December 2018.

The OECD AI Policy Observatory (OECD.AI) is an inclusive hub for public policy on AI. It aims to help countries encourage, nurture and monitor the responsible development of trustworthy AI systems for the benefit of society.

This country report has been created on the 25th of February 2020. Please visit https://ec.europa.eu/knowledge4policy/ai-watch/portugal-ai-strategy-report for regular updates.