

THE N(EU) WAY TO ARTIFICIAL INTELLIGENCE

Challenges and Perspectives for Southern Europe

Introduction*

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➔ **INVESTMENTS – comparatively speaking, EU investments are low and fragmented**

In 2018, US companies invested \$18.7 billion in AI, compared to China's \$14.35 billion. The largest 5 EU Member States were not even able to attain together the level of UK investment (\$1.255 bn vs. \$1.27 bn), and only slightly surpassing the much less populated Israel (\$ 1.044 bn).

(Source: Artificial Intelligence Index Report 2019, Stanford University)

➔ **PATENTS – depending on different stats and sources, East Asia and the US are ahead and Europe is losing its edge**

Between 2009 and 2018, Chinese AI players filled 57% of patent requests, versus 13% from the US and 7% from South Korea and the European Union.

(Source: European Commission, Joint Research Center, 2018)

➔ **TECHNOLOGICAL TRANSFER – EU startups scale up less than the US and China but also the UK and Israel**

Out of 41 AI unicorns in March 2019, 18 were based in the US, 17 in China and only 1 in the EU

(Source: Global Artificial Intelligence Industry Data Report, China Academy of Information and Communications Technology).

➔ **Low investment and high fragmentation** reduce EU chances to become an AI world leader, frustrating the **high potential** to be found for instance in the number of top EU scientists (by far the highest in the world, according to a recent study by Tsinghua University).

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The global race for AI

Tirso VIRGÓS VARELA, Researcher, EsadeGeo



New Generation of AI Development Plan. **Focus on the role of the state**, protecting business that make it to the top. **Three-step strategy:**

- ➔ 2020: Globally advanced AI player
- ➔ 2025: AI as main driving force of China's industrial upgrading
- ➔ 2030: **World leader in AI**



American AI Initiative. Focus on the role of the market, and **against "heavy handed innovation-killing models"**. Promotion of "**American values**" such as rule of law, freedom, and privacy.



White Paper on Artificial Intelligence. **Ecosystem of trust and of excellence**, with focus on non-discrimination, robustness, transparency and accuracy. "**Regulatory and investment-oriented approach.**"

- ➔ The very **concept of an AI race could turn competition between countries and power blocs into a confrontation**. A “winner takes all” mentality can shape behaviors towards “survivalism”.

- ➔ Two main reasons to aim for a global framework to govern AI:
 - 1 Protection of the stability of the international system: rise of “**AI nationalism**”, risk of a new “**data colonialism**”, etc.

 - 2 Spill-over effects of the development and adoption of AI, e.g., **enhanced capabilities of drones** and other types of Lethal Autonomous Weapons, empowered **cyber-attackers**.

- ➔ Need for a **global arrangement that allows for flexibility and regional experimentation** (Rodrik, 2020), so as not “**to deal with Star Trek technology with laws for technology straight out of the WWII**” (Bakerjian, 2019).

- ➔ A proposal that is neither too informal, nor a complex set of new global oversight bodies.
- ➔ Two types of principles for global regulation of AI, based on documents approved by the OECD (2019) and the G20 (2019):
 - 1 **Core principles (all states):** Common definition of what AI is, requirement for human oversight on all operations of Lethal Autonomous Weapons, transparency in the processes and outcomes of AI-powered machines, robust AI.
 - 2 **Extended principles (“coalition of the willing”):** Legal instruments to ensure accountability of those in charge of a Lethal Autonomous Weapon, broad agreement on protection of the private sphere of citizens, and non-discrimination.
- ➔ The EU is well positioned to take the lead in setting these global rules. **Experience dealing with multilateral negotiations**, as well as **“regulatory power”**.

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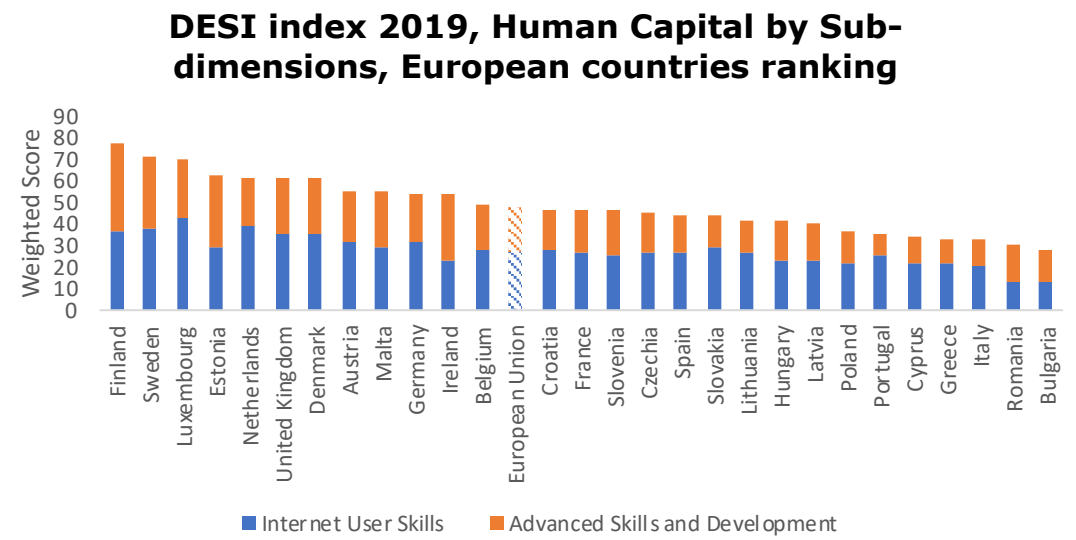
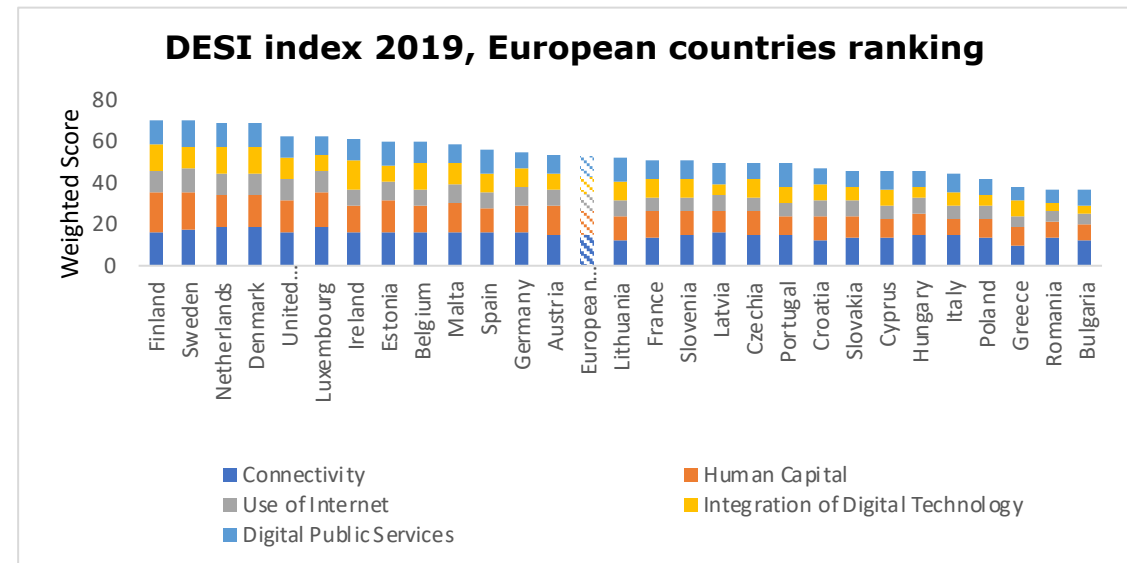
AI adoption in Europe

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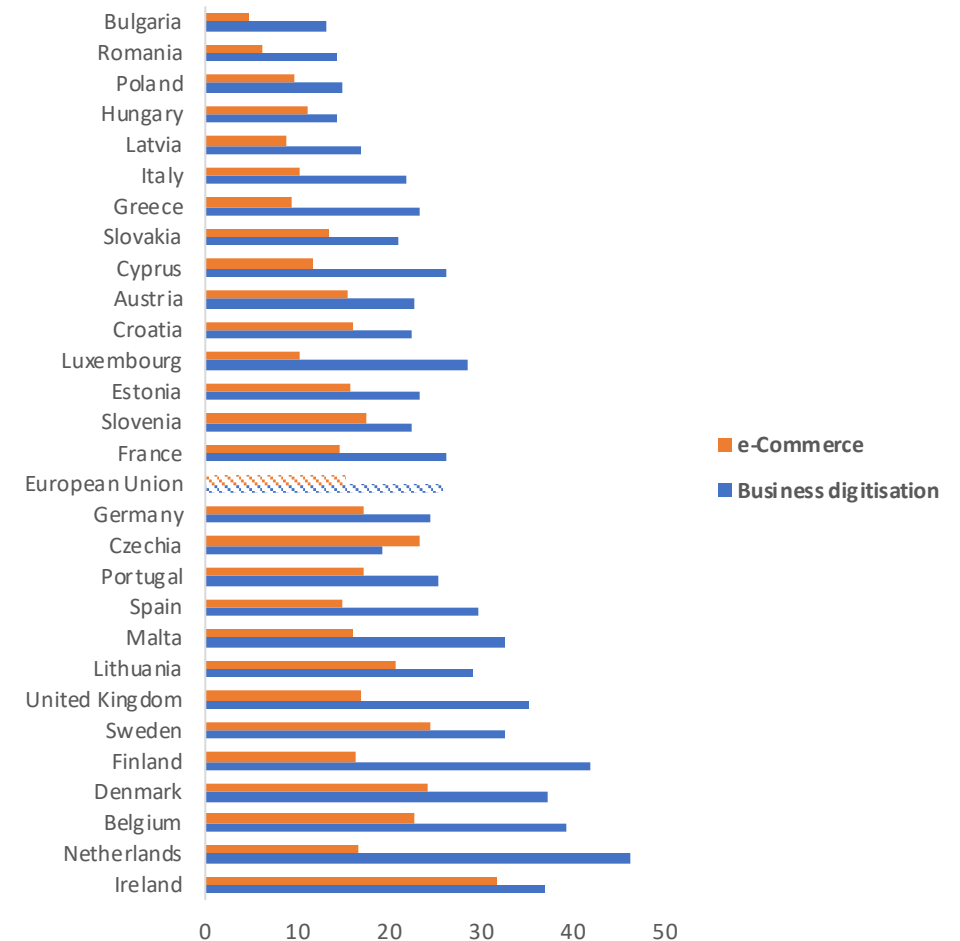
European AI landscape – Significant asymmetries between Northern and Southern countries

- DESI 2019 signals **an asymmetry** in EUs digital performance. Most of the Southern – Eastern European countries ranked below EU average.
- UK, Sweden, Finland, and Ireland seem more ready to welcome an AI transition (ranked in the top 25% in AI Readiness Index for at least the half categories of the index). Spain, Portugal, Italy, and Greece did not achieve this percentile in any of the examined categories (Bughin et al., 2019).
- Southern EU member states show severe insufficiencies in digital human capital skills.
 - Considerable risk of a potential digital exclusion exists.
 - ICT specialists are not equally shared among EU member states and they are in shortage as well.



- Only two European firms are in the worldwide top 30 digitized companies, and at the end of 2017, none of the 10 largest internet companies worldwide was based in Europe (Bughin et al., 2019).
- Less than 50% of the European firms have implemented one AI technology - most in the pilot stage (Bughin et al., 2019).
- Start-ups in the UK received 55% of the EU total investment (2011 to mid-2018), followed by Germany (14%) and France (13%). The remaining 25 countries appropriated less than 20% of all private AI equity (OECD, 2019a).
- Digital Intensity Index (DII): In Bulgaria, Greece, Spain, and Italy, over 55% of firms have low investments in digital technologies.
- Gap in DESI Integration of Digital Technology index: Northern countries achieve the highest positions, whereas Cyprus, Greece, and Italy rank below the EU average.

DESI index 2019, Integration of Digital Technology by Sub-dimensions, European countries ranking



Ensuring inclusive and sustainable growth requires that the geographical disparities regarding AI adoption inside the continent are confronted.

- It is vital to promote collaboration among research institutions and encourage synergies with the private sector.
- Investment in AI development is significantly lower in the Southern firms compared to their Northern counterparts.
 - Small share of R&D investment economies → high concentration in the 4 largest EU economies
- Southern European Firms:
 - appear to be less capable of developing, adopting and transferring innovation and technological breakthroughs.
 - cannot fully appropriate the benefits that AI could offer to their operation and services.
- Small business size, which is a structural characteristic of the business demography in the South, is a significant barrier and affects any efforts to improve the technological advancement and invest heavily in AI.

SMEs have to deal with a series of issues for being able to follow the current trends in AI adoption.

- Cultural barriers and a fear of change and transition to a new business model. The transition to an AI model, in most cases, is not included in the strategic business objectives.
- The shortage of technology experts and the difficulty for SMEs to attract them, delays the AI escalation.
- SMEs digitization is evolving at a slower pace relating to bigger players.
- Lack of prominent technology companies in Europe: A new entrepreneur would be more willing to undertake AI investments if larger firms exist that could buy or invest in this venture were available, mitigating the undertaken risk substantially.
- Start-ups and SMEs might be in an adverse position compared to larger firms in absorbing public funding - bureaucratic and technical procedures are not negligible.

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European Commission's Digital & AI Strategy

Stefano DA EMPOLI, President, I-Com

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i. Communication "Shaping Europe's digital future"

Three key objectives:

- 1) a technology that works for people
- 2) a fair and competitive economy
- 3) an open, democratic and sustainable society.

ii. Communication "European Data Strategy"

According to the strategy, Europe has the potential to become a leader in the data economy, providing for a single market for data and a larger role for European companies

However, several critical issues need to be tackled:

- 1) availability of data
- 2) imbalances of market power
- 3) data interoperability and quality
- 4) data governance
- 5) data infrastructures and technologies
- 6) empowering individuals to exercise their rights
- 7) skills and data literacy
- 8) cybersecurity

iii. AI White paper

➔ MAIN CONTENTS

- In the so called “**ecosystem of excellence**”, among several planned actions, the Commission aims at proposing to the Member States a revision of the 2018 Coordination Plan, facilitating the **creation of excellence and testing centers** that can combine European, national and private investments.
- This involves working with Member States to ensure that at least **one digital innovation hub per country** has a high degree of specialization in AI, setting up a **new public-private partnership in AI, data and robotics** in the context of the Horizon Europe Programme.

➔ MAIN REMARKS

- While the EU should strive to improve its current standing in research and innovation, most companies, especially SMEs, would be either only or mainly **AI users**.
- Therefore, EU objectives to increase R&D and productive excellence should not jeopardize the possibility for EU citizens and companies to have **access to the best available AI technologies at a competitive price**.
- Both **training and advice to SMEs** should be key activities for AI specialized **digital innovation hubs** (DIHs). For this reason, foreseeing only one DIH per Member State may involve a sizeable geographical barrier for SMEs, especially in larger countries.
- **Public-Private Partnerships** and **open innovation** involving companies of different size and from different sectors would be pivotal.

MAIN CONTENTS

- The **risk-based approach**, taken by the Commission, allows for a proportionate regulatory intervention, heavier for high-risk AI applications than for other lower-risk applications.
- According to the white paper, an AI application should be considered high-risk when it meets the following **two cumulative criteria**: 1) it is employed in a **sector** where, given the characteristics of the activities typically undertaken, significant risks can be expected to occur (for instance, healthcare, transport, energy and parts of the public sector); 2) the AI application in the sensitive sector is used in such a **manner** that significant risks are likely to arise (based on the kind of impact on presumably affected parties).
- Moreover, the use of AI applications would always be considered as high-risk in **some other “exceptional instances”** such as (though not exclusively) for employment processes, biometric identification and other intrusive surveillance technologies.
- **Mandatory requirements** for high-risk applications would cover several areas: 1) training data; 2) data and record-keeping; 3) information to be provided 4) robustness and accuracy; 5) human oversight; 6) specific requirements for certain specific applications, such as biometric identification.
- These requirements would be at least in part verified under **prior conformity assessments**, in line with already existing mechanisms for a large number of products being placed on the EU’s internal market.
- Of course, **ex post controls** could be still enforced by competent national authorities.
- For **non-high risk applications**, the Commission envisages a voluntary labelling scheme, allowing the economic operators to signal the trustworthiness of their products or services.

➔ MAIN REMARKS

- To start with, a **EU-wide regulatory approach** is preferable in order to avoid major risks of internal market fragmentation. Therefore, Member States should refrain from unilateral moves and look for agreements and alliances at EU level.
- Although some new legislation is certainly required and a EU-wide regulatory framework is surely preferable to national, current legislation should apply whenever possible in order to avoid **excessive market fragmentation** and **uncertainty** and increase **compliance costs** for companies, especially SMEs.
- Whenever possible, a **clearer interpretation of current legislation** to be applied to all products, including those embedding AI, should be chosen instead of new legislation reserved to AI products.
- Although many mentioned concerns deserve a high level of scrutiny and sometimes need to be addressed by ad hoc regulation, it would be fairer to **compare AI applications with a human-based benchmark**. It would not be realistic to expect AI achieving an error-free perfection where, in the same field, the same standard is not currently applied. This requirement could significantly stifle innovation, especially from SMEs and new entrants.
- If the two proposed cumulative criteria to determine “high-risk” AI applications seem quite logical and could help provide legal certainty, **exceptional additional instances** should be better defined and limited to specific cases in order to avoid any ambiguity, where the aim of the risk-assessment approach is exactly the opposite.
- Concerning enforcement, the regulatory framework should mostly rely on **ex-ante self-assessment**, instead of an external procedure, in order to speed up the innovation process and ensuring a thriving European AI ecosystem, setting low compliance costs for SMEs, and **ex-post enforcement**, paramount to guaranteeing full compliance by AI developers and deployers.

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