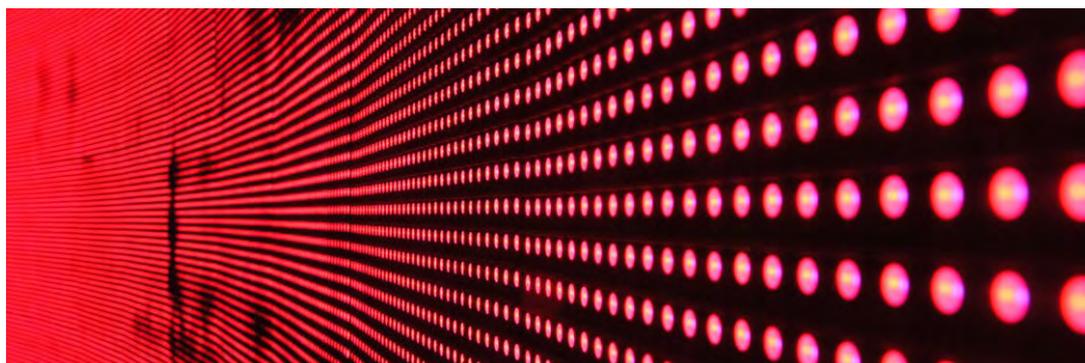


THE EUROPEAN ANSWER TO THE DIGITAL REVOLUTION

HOW TO ENSURE EUROPE'S COMPETITIVE ADVANTAGE?



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Over the years following the birth of the iPhone in 2007, the EU has become a digital laggard. The tech giants dominating the European digital economy in 2018 hail from the US, and their main competitors are Chinese, not European companies. Google, Amazon, Facebook and Apple (GAFA) have now a higher market capitalization than the whole French index CAC40. All the while almost all sectors in which European companies are globally competitive are undergoing a fast digital transformation whose outcome is unknown. How can the EU keep its competitive advantage in such a changing environment? What is the European answer to the digital revolution?

Ensuring Europe's competitiveness in the face of the digital revolution requires two fundamental measures. On the one hand, reducing costs and improving quality of services through optimization techniques and digital transformation of its industries. On the other, innovating and developing new services in new sectors. First of all, the European Union should participate in the coordination of knowledge and skills transfer, to support member states' efforts to help traditional sectors in their digital transforma-

tion. Learning from success factors of other parts of the world, Europe should focus its efforts on facilitating access to public and private funding, and deepening the Digital Single market through harmonisation. Other priorities should be the building of "innovation ecosystems" of capital, talent and local regulatory expertise, as well as improving transfers between research and businesses. Catch-up strategies however are not enough to ensure a long term competitive advantage. This requires also capitalizing on Europe's own strengths and shared visions, for instance regarding to fundamental rights and the ecological transition. In order to do so, past strategies based on individual "flagship" cooperation projects should be left out.

1. Supporting the Digital Transformation of European Industries

Apart from keeping up with the development in new sectors, the main challenge in the EU in the coming years remains the transformation of its "traditional industries", as the "platformisation" of the economy is restructuring value chains. Industries like car manufactur-

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ing, machine building or medical equipment make Europe's traditional strength. Constantly improving their productivity and innovative potential by successfully adopting new technologies will thus be crucial in order to maintain the competitiveness of the region. To this end, the EU should step up its policies geared at supporting the transformation of European industries beyond the Digitizing European Industries initiative, in particular with regards to skills and re-skilling. Competitiveness-enhancing policies should specifically address three known imbalances, which are currently creating bottlenecks and slowing down the digital transformation of European industries.

1. Imbalances between smaller and larger firms:

Statistics by the Commission show that the size of a company is a major factor to determine investments in the digital skills of its workforce. The bigger a company the more re-skilling opportunities it provides to its employees. Smaller companies (less than 50 employees) on the other hand often do not have the means to address skill gaps in their workforce, while technology adoption is much slower. A European approach should thus focus on initiatives for technology, knowledge and skills dissemination. An EU-wide program for re-skilling coordinated by the EU and supported by large corporations could transfer their expertise to SMEs, similar to the European Coalition for Digital Skills for private persons.

2. Imbalances between firms/sectors:

Many European industries still lag behind the frontrunners in their adoption of digital, productivity-enhancing technologies. While banking, IT- and media services are at the technology frontier, sectors like construction, agriculture and parts of manufacturing are catching up much slower. Within sectors access to data and analytical capabilities are often distributed unequally. Voluntary data-sharing platforms and open data concepts in general should play a larger role in the future to alleviate this asym-

metry. National governments should accompany these efforts to make sure that the governance of for example data-sharing platforms does not favour individual large corporations but benefits all participating companies.

3. Imbalances between countries:

Broadly speaking, the take up of digital technologies has so far been faster in Northern and Western Europe and slower in Southern and Eastern Europe. Government-supported initiatives to foster the digital transformation of manufacturing industries are also more advanced in countries like Germany and France than in many Southern and Eastern European countries. The EU should deepen its role as a coordinator bringing together the various national initiatives such as "Industrie 4.0" with the specific aim of generating a knowledge transfer and best practices from the core to the periphery. "Industrie 4.0" and "Industrie du Futur" could further broaden their cooperation and develop joint networks of universities, corporations and regulators.

2. Developing Innovation Ecosystems

European innovation systems combining capital, talent and local expertise are increasingly successful in nurturing the growth of technology start-ups with global ambitions, for example in Paris and Berlin. Yet, scale-ups remain difficult in the Single Market. Access to finance remains a problem, especially in later-stage funding rounds. There is less research on ground-breaking technology like Artificial Intelligence in Europe than in China and the US and companies in the EU are also less effective in turning research into profits. Overcoming this situation and improving the EU's abilities to develop and grow new businesses and services so requires, on the one hand, a thorough analysis of the main success factors of Europe's two main competitors in the digital economy, the US and China (see boxes below).

BOX 1 ■ Key success factors in other regions—USA

A great deal of literature exists on the reasons explaining the success of American tech firms like Apple, Microsoft, Google, or Facebook. Different factors seem to have contributed to this success:

- **An effective clustering strategy:** with the creation of the first university-owned industrial park in Palo Alto (the Stanford Research Park in 1951, hosting notably Hewlett-Packard), a new model emerged for rapidly turning innovations into business, relying on an entrepreneurial spirit among students, researchers and an institutional framework favouring risk-taking.
- **Substantial initial public funding for key technologies:** Between a third and a half of all computer science and technology innovations have been at least partly funded by the Advanced Research Projects Agency (ARPA) founded in 1958, according to Michel Dertouzos, MIT.
- **A wide access to private funding:** Average venture capital-backed US companies receive five times more VC than its EU counterparts. Access to financial markets and high stock market valuations then allowed companies like Amazon or Uber to continuously invest in growth and internationalisation strategies without being profitable.
- **Rapid internationalisation and diversification strategies:** While Google had a rapid success with its search engine, it kept innovating and built an ecosystem of services, at the centre of both consumer and business practices in the digital world.
- **A very high attractiveness for human capital:** Almost a third of Silicon Valley engineers are immigrants, providing companies there with important skills, know-how and innovation capacities.
- **A favourable legal framework:** Building on a permissive rather than a precautionary approach, the US government rapidly introduced a framework encouraging new technologies and business models, such as the limited liability of intermediaries (Section 230 of the Communications Decency Act) in 1996.

BOX 2 ■ Key success factors in other regions—China

Chinese corporations like Alibaba, Baidu, Tencent or Xiaomi are today ranked among the largest and most valuable companies in the world. They cumulate substantial market capitalisations (Tencent or Alibaba have a market capitalization of around half a trillion dollars) and numbers of users (Tencent's social network WeChat has 1 billion users). While these corporations all have specific backgrounds, one can notice several trends explaining the success of China in the digital economy:

- **Access to a vast domestic market:** Chinese firms managed to adapt their strategies to the language, cultural specificities and values of a growing middle-class market.
- **Diversification strategies of domestic giants:** While initially building on specialisation and the reproduction of foreign successes, Chinese firms managed to rapidly constitute national quasi-monopolies and to diversify their activities by building new services heavily relying on the vast use of mobile generated data.
- **State interventions:** The Chinese government introduced several measures creating Internet access restrictions to foreign services like Facebook or data localisation provisions. These measures are however by no means exclusively economically motivated. Rather, they follow from the Chinese government's objective of close surveillance, censorship of its population and national security considerations.

On the other hand, simply copying success factors from other countries might not always be feasible or desirable, as in the case of Chinese data protectionism and surveillance programs. Instead, the EU has to take its unique mixture of linguistic diversity, decentralisation and fragmentation as a starting point and develop strategies from there.

1. **Financing of start-ups:** Capital for start-ups is harder to get by in the EU than in the US. One of the reasons for this is the unsolved loan/equity problem in funding. European start-ups still have to rely more often on local banks and loan-based financing, as equity-financing is not as developed as in the US. Investors in Europe also take overall lower risks when investing in start-ups as the prospects of profits of start-ups investments are lower. Finally, European companies are much more reluctant to buy technology start-ups at an early stage compared to American companies. The reasons for these developments lie, among other things, in a culture less prone to risk, but also sometimes in a lack of knowledge about technology and the prospects of new business models. The number of analysts in this field for example is lower than in the US. European governments should find ways to increase the willingness of European corporations

for instance, supported by Schröder and Chirac in 2005, was supposed to be Europe's answer to existing American "Boeings" in the digital economy, in this case search engines. The program was eventually abandoned; again due to divergent national interests.

The first common policy agenda was set up with the Lisbon Strategy launched in spring 2000. It focused on the transition to a "knowledge society", supporting research and education, but also the dissemination of information and communication technologies, namely e-commerce and mobile communications. Once more, results were poor: in the early 2010s, US firms already held 80% of stock market valuations of tech firms; European ones only 3%. When the Lisbon strategy was launched, half of the sales in the mobile industry were from European companies such as Alcatel, Ericsson, Nokia, Philips or Sagem. They almost completely disappeared in favor of smartphones today.

The potential of European cooperation should not be underestimated however. In this respect, it is worth thinking beyond the current start-up model (linked to the App economy that emerged with the wide spreading of smartphones) and reconsider the role of larger corporations. The emerging wave of technological innovation (from machine learning to Internet of Things, robotics etc...) might be much more hardware-based as well as capital- and knowledge-intensive, and most of all dependent on access to vast amounts of often specialized data troves. This suggests that European cooperation can be very effective if it is based on:

- the definition of common standards;
- joint investment in costly infrastructures or research & development;
- common research programs and knowledge-sharing;
- the support of data-pooling between both public and private organizations.

These efforts should avoid "watering can" approaches, meaning untargeted or fragmented support. To this end, economic fields with great potential for European or Franco-German cooperation should be identified. They should match with European inherent strengths and shared visions and leverage on the importance of Europe's internal market, representing 500 million "data subjects", in order to develop new standards and increase

the competitive advantage of European businesses. Three areas could fulfil this purpose:

- **The convergence of ecological and digital transitions:** Europe is a leading actor in the field of sustainable development, both on a political and economic level. The building of technical solutions for a sustainable future will heavily rely on network technologies, creating important business opportunities and growth potential in various sectors (energy, agriculture, mobility). Smart grids or IoT solutions are already creating new models that allow important optimizations in the use of resources and foster new distribution models. This will also apply to the digital sector itself, where Green IT solutions will help to reduce the ecological impact of networks, data centres, or processors.
- **Data security and privacy:** The global impact of the General Data Protection Regulation (GDPR) but also previous European jurisprudence (like the "right to be forgotten") shows that the EU is a key player in the definition of the principles and values that guide the international development of the digital revolution. This position could give European companies a competitive edge, as awareness around privacy and data security has risen. The success of start-ups like the French "Snips", developing AI solutions and chatbots respectful of privacy, or the German "Nextcloud", a personal information management system, show that there is a growing demand for technological and business solutions "made in Europe", standing for a more respectful handling of user's data and greater security guarantees.
- **Alternative models for the Internet:** The European Union has already taken important measures to limit monopolistic positions and lock-in strategies that prevent free competition both on consumer and business markets. This agenda has been pushed forward through legal procedures (Commission vs. Microsoft or

Google Shopping/Android) or new pieces of legislation, on data portability for instance. This approach should be followed by a proactive support of alternatives (e.g. open source technologies promoting interoperability between services) that can allow the emergence of a more open and decentralized technological framework, freeing and spreading innovation capacities of all players.

4. Conclusion and Outlook

In 2015, the European Commission launched the Digital Single Market Strategy, mostly aiming at the harmonisation and updating of rules within the European Union. It will soon be complemented by the implementation of a common AI and data strategy, as well as a “Digital Europe” initiative, supporting common infrastructures and European businesses. The strategy is a step in the right direction that the new Commission should expand and deepen from 2019 on in various areas. Political capital in the EU should be invested in initiatives that help traditional industries in their digital transformation in order to retain their current competitive advantages and build integrated European innovation ecosystems around future technologies in order to deepen the Single Market.

But filling the gap will also need a serious upgrade of ambitions, instruments and resources, on top of existing national initiatives. A good opportunity for European lawmakers to give proof of their ambition towards Europe’s digital competitiveness presents itself with the current proposal of the Commission on the next budget programme for research and innovation. Apart from a modest shift of financial resources within the MFF from agriculture and cohesion to research and innovation, the Commission also proposes to introduce innovative methods and tools and streamline some of its processes. Concretely, with Horizon Europe, the successor of Horizon 2020, the Commission wants to introduce new instruments such as missions, the European Innovation Council as a one stop shop for startups and SMEs and a new focus on disruptive innovation into its multi-billion-euro research and innovation fund. These proposals will however have to be approved by the Council and the Parliament. The coming months will show how this important struggle for future innovation “made in Europe” will evolve.

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