

INTRODUCTION TO DIGITAL ECONOMY IN THE EU

CLASS NOTES

Brief description

UNED's Jean Monnet Chair about Digital Economy in the EU presents this introductory document that provides an overview of the issue



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Introduction to digital economy in the EU

Europe's 25 million small and medium enterprises (SMEs) are the backbone of the EU economy.

Information and Communication Technologies (ICTs) are increasingly embedded in our lives, both in the professional sphere and in our personal lives. They are also playing an increasingly important role in the economy and society of the 21st century, imposing new ways of working and interacting, and promoting an increasingly digital world.

In Europe, the digital economy is in the core of the priorities



established by the European Commission (EC) for the coming years, as indicated by Commission president Von der Leyen. It is the single most important driver of innovation, competitiveness and employment. An appropriate

adoption of digital technologies by the European companies will be a key for their future growth. It is increasingly important to become familiar with a subject which affects more and more EU companies, institutions and citizens, in an area that needs



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deepen teaching in EU studies.

Europe's 25 million small and medium enterprises (SMEs) are the backbone of the EU economy.

They employ around 100 million people, account for more than half of Europe's GDP and play a key role in adding value in every sector of the economy¹. Although many big companies and entrepreneurs in

Europe are already using ICTs to improve their businesses and their economic impact, that number could be increased. In particular the SMEs could grow two to three times faster and create new jobs by embracing ICTs. The digitization of manufacturing can transform the entire industry, promoting re-location of industry in Europe.

¹ An SME Strategy for a sustainable and digital Europe, COM(2020) 103 final:
https://ec.europa.eu/info/sites/info/files/communication-sme-strategy-march-2020_en.pdf

The concept of digital economy

An economy based on digital technologies

The massive advent of the internet during the last decade of the 20th century can be considered the fundamental pillar of the explosion of the digital economy. Already in the 21st century, the unstoppable evolution of information and communication technologies has reinforced this unprecedented economic change. This has been achieved by:

- promoting connectivity and interpersonal communications with new devices such as tablets or smartphones, and better networks such as fiber optics or 5G,
- facilitating the connection of objects with sensors (Internet of things) which promotes important changes in consumers and industries,
- storing and managing the increase of data generated by these communications and sensors, and making them economically useful through techniques such as big data or artificial intelligence, with data analytics and new algorithms,

- providing data and technologies to design new useful applications for companies, citizens and public administrations (for example, solutions for smart cities),
- promoting new business models that alter the rules of the game, such as cloud computing models or collaborative service platforms.

The term "*digital economy*"² therefore refers generically to the amalgamation of aspects involving "*an economy based on digital technologies*" as indicated by the European Commission³. In this line, terms such as "*internet economy*" or "*web economy*" have also been used, which may be simplifications, by focusing on a specific digital medium, or "*network economy*" highlighting the interconnection aspect that ICTs provide.

In this sense, the debates on the term have evolved: from focusing on the internet economy (its companies, its models, the specific internet sector in particular), the interest has shifted to digitization. That

² The term is often attributed, as one of the first to spread it, to Don Tapscott in "The Digital Economy: Promise and Peril in the Age of Networked Intelligence" (Tapscott 1996).

³ Expert Group on Taxation of the Digital Economy, European Commission, 2013. Brussels.

http://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/gen_info/good_governance_matters/digital/general_issues.pdf

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is, how companies, citizens or public administrations adopt these technologies and enter the digital world. Lately the term "*digital transformation*" has also been adopted to refer to these changes. Both terms "*digitization*" and "digital transformation" have been used in an equivalent way, although we can refer to digital transformation as a more advanced stage: "*digitization*" would be reserved for the adoption of technologies to join the digital world, and "*digital transformation*" would refer to a deeper change (of procedures, processes, business culture, etc.) that would cause "*to be digital*" in a more integrated and comprehensive way. In the evolution of the term it progresses from simply using digital technologies versus placing them at the core of all business processes. The degree of internalization of "*the digital paradigm*" makes the difference.

These changes, as indicated, affect resources (human and infrastructures), processes and procedures, the interactions (for example with customers and suppliers), the ways of managing, and

even the business culture. Lately, special attention is being paid to its consequences in the labour market, placing special emphasis on company personnel, how these technological changes affect the labour force and what implications they have on their training (robotization on the one hand, and digital skills to guarantee employability on the other).

In this progressive transformation, digitization seems to affect more directly the most intangible or "*informational*" sectors compared to "*primary*" sectors with a more physical component and therefore less digitizable. Thus, for example, we have witnessed the digitization of sectors such as music, publications and the press, or the audio-visual sector. In contrast, sectors such as agriculture progress more slowly in incorporating ICTs into their processes and businesses.

In this way, digitization cannot be limited, for example, to mere electronic commerce, but network effects and more intangible aspects become important. The network effect refers to the competitive advantages



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provided by having many connected users, so that the value of a product or service increases for new users and existing users, as the number of total users increases, since it allows greater number of interactions, greater commercial exposure or lower costs (social media are good examples). Likewise, in the digital world of information, the intangible aspect is also relevant. In this line, Brynjolfsson & Kahin⁴ state: *"The term information economy has come to mean the broad, long-term trend toward the expansion of information- and knowledge-based assets and value relative to the tangible assets and products associated with agriculture, mining, and manufacturing. The term digital economy refers specifically to the recent and still largely unrealized transformation of all sectors of the economy by the computer-enabled digitization of information".*

Given the massive adoption of technology, the digital economy is blurring as opposed to the traditional economy. In the future, it

will not be possible to differentiate between the two because we will find ourselves inside a single reality, which could be defined as the digitized economy. Ultimately, from a business perspective, the transformation of all sectors and markets through digitization can foster the production of higher quality goods and services at a reduced cost, and improve society to make it more sustainable.

⁴ Brynjolfsson E and Kahin, B, eds. (2002). Understanding the Digital Economy. Massachusetts Institute of Technology, Cambridge, MA.

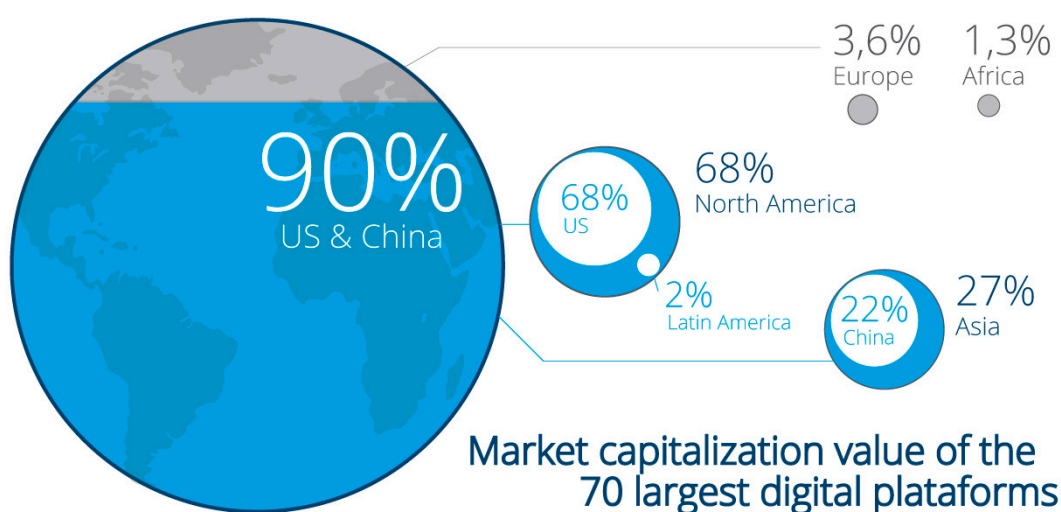
The digital economy in the world

Expanding data and platforming

According to the 2019 UN UNCTAD report⁵ the digital economy is now growing faster than the traditional one, but it is not equally distributed.

In the digital economy, the United States and China are in the lead. Together, they accumulate, for example, 50% of the world's spending on IoT, and more than 75% of the global market for public cloud computing. They also represent 90% of the market capitalization of the 70 largest digital platforms in the world. Europe's share is 4% and Africa and Latin America together is only 1%.

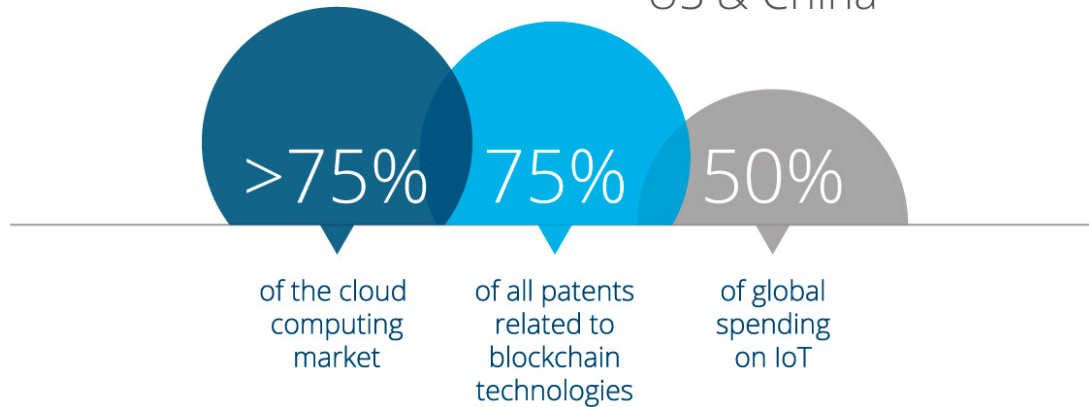
According to this report, global traffic over Internet Protocol (IP), a proxy for data flows, went from about 100 gigabytes (GB) a day in 1992 to more than 45,000 GB per second in 2017 (see chart). This happens despite the world is only in early stages of the economy based on



⁵ Digital Economy Report 2019 - Value Creation and Capture: Implications for Developing Countries (UNCTAD/DER/2019)
https://unctad.org/system/files/official-document/der2019_en.pdf

Geography of the digital economy

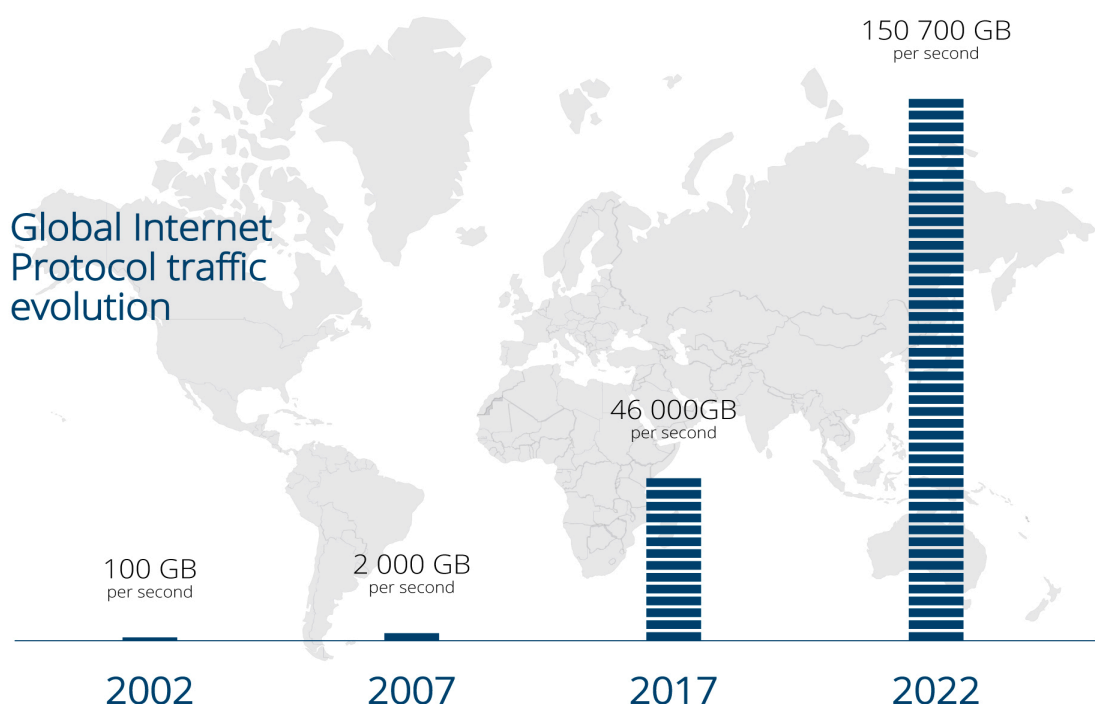
US & China



data. Global IP traffic is projected to reach 150,700 GB per second by 2022, driven by new personal connections and the Internet of Things explosion.

Along with rapidly expanding data, this UN report sees platforming as the second driving factor. In the last ten years, a plethora of digital platforms using data-

driven business models have emerged around the world, altering traditional industries in their wake by allowing users and businesses to interact digitally. The power of the platforms is reflected in their business volumes and their market capitalization. Companies like Uber or Airbnb, Amazon, Alibaba, Facebook or



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eBay are some relevant examples. For example, Google accounts for around 90% of the Internet search market. Facebook accounts for two-thirds of the global social media market and is the leading social media platform in more than 90% of the world's economies. Amazon states a share of almost 40% of the world's online retail sales, and is the leading provider of cloud infrastructure services.

The Digital Economy in the EU

Importance of the digital economy to the EU

The firm commitment to digitization dates back to the 2010 Digital Agenda for Europe, and especially to the launch of the Digital Single Market in 2014-15, promoted during the mandate of President Jean-Claude Juncker. Since that time, going digital has received a growing interest from European authorities. It is one of the most important priorities for the current European Commission, as the President Ursula von der Leyen points out in her *Mission Letter*⁷ for Commissioner Margrethe Vestager Executive Vice-President-designate for a Europe fit for the Digital Age, in September 2019:

"I would like to entrust you with the role of Executive Vice-President for a Europe fit for the Digital Age.

Over the next five years, Europe must focus on maintaining our digital leadership where we have it, catching up where we lag behind and moving first on new-generation



6 Una Estrategia para el Mercado Único Digital de Europa COM(2015) 192 final:
<https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52015DC0192&from=EN>

7 https://ec.europa.eu/commission/sites/beta-political/files/mission-letter-margrethe-vestager_2019_en.pdf

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technologies. This must cut across all of our work, from industry to innovation. At the same time, we must ensure that the European way is characterised by our human and ethical approach. New technologies can never mean new values.

In striving for digital leadership, we must focus on making markets work better for consumers, business and society, and must support industry to adapt to globalisation and the twin climate and digital transitions. We need companies that compete on equal terms and consumers that can benefit from lower prices, greater choice and better quality.

As Executive Vice-President, you will have a dual function. You will chair the Commissioners' Group on a Europe fit for the Digital Age. In addition, you will be responsible for the competition portfolio. In leading the work on a Europe fit for the Digital Age, you will ensure all policy dimensions are fully taken into account (...)

(...) The digital transition will have an impact on every aspect of our economy and society. Your task will be to ensure that Europe fully grasps the potential of the digital age and strengthens its industry and innovation capacity. This will be a key part of strengthening our technological leadership and strategic autonomy..."

Mission Letter for Commissioner Margrethe Vestager.

Von der Leyen invites Vestager to work with the rest of commissioners on a new **long-term strategy for Europe's industrial future**, cross-fertilisation between civil, defence and space industries. and a **new SME strategy**. The president also raises the need to define a European approach on **artificial intelligence**, including its human and ethical implications. use and share non-personalised of big data to develop new technologies and business models and to coordinate the work on upgrading our liability and safety rules for digital platforms, services and products as part of a new **Digital Services Act**. Finally, a **digital taxation** is requested to find a consensus at international level by the end of 2020 or to propose a fair



European tax.

In February 2020, the Commission set out its vision for the digital transformation in the communication “*Shaping Europe’s digital future*”⁷ to deliver an inclusive use of technology that works for people and respects EU fundamental values. In this document, the Commission establishes the key objectives, for the next five years, to ensure that digital solutions help Europe to pursue its own way towards a digital transformation that works for the benefit of people through respecting our values. It will also put Europe in a position to be a trendsetter in the global debate. The priorities set by the Commission are:

1. Technology that works for people.
2. A fair and competitive economy.
3. An open, democratic and sustainable society.

In this document the Commission considers that “*for Europe to truly influence the way in which digital solutions are developed and used on a global scale, it needs to be a strong, independent and purposeful digital player in its own right. In order to achieve this, a clear framework that promotes trustworthy, digitally enabled interactions across society, for people as well as for businesses, is needed*”.

Other relevant documents are the *White Paper on Artificial Intelligence*⁸ and the European Data Strategy⁹ as the first two pillars of the new digital strategy of the Commission. Additionally, the Commission published also its new SME strategy¹⁰ for a sustainable and digital Europe.

7 Shaping Europe’s digital future, COM(2020) 67 final:

https://ec.europa.eu/info/sites/info/files/communication-shaping-europes-digital-future-feb2020_en_3.pdf

8 White Paper on Artificial Intelligence - A European approach to excellence and trust, COM(2020) 65 final:

https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf

9 A European strategy for data, COM(2020) 66 final:

https://ec.europa.eu/info/sites/info/files/communication-european-strategy-data-19feb2020_en.pdf

10 An SME Strategy for a sustainable and digital Europe, COM(2020) 103 final:

https://ec.europa.eu/info/sites/info/files/communication-sme-strategy-march-2020_en.pdf

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The situation of the EU in digital business

European companies are making an effort to introduce the digital world into their businesses but there is still a long way to go, especially for SMEs. One of the main obstacles to the digitisation of SMEs is the digital knowledge gap, which is caused by low levels of digital literacy among owners, managers and employees. Addressing these shortcomings will be vital to ensure a robust recovery.

The Digital Economy and Society Index (DESI) monitors Europe's overall digital performance and tracks the progress of EU countries in digital competitiveness. By providing data on the state of digitisation of each Member State, it helps them identify areas requiring priority investment and action. In the field of digitization, progress is seen from previous years.

Just prior to the pandemic, integration of digital technologies by businesses showed large

Digital Economy and Society Index. DESI

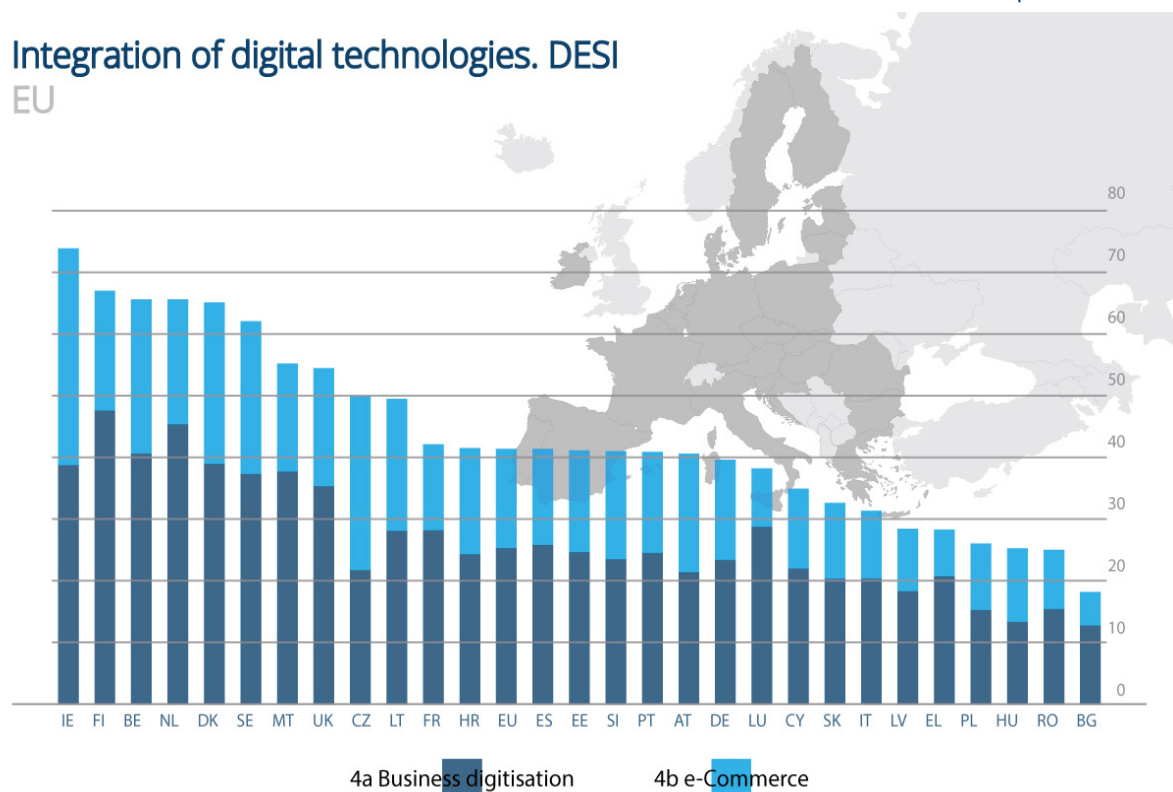
	EU	
	DESI 2018	DESI 2020
4a1 Electronic information sharing % enterprises	34% 2017	34% 2019
4a2 Social media % enterprises	21% 2017	25% 2019
43a Big data % enterprises	10% 2016	12% 2018
4a4 Cloud % enterprises	NA	18% 2018
Row 4b1 SMEs selling online % SMEs	17% 2017	18% 2019
4b2 e-Commerce turnover % SMEs	10% 2017	11% 2019
43b Selling online cross-border % SMEs	8% 2017	8% 2019

DESI 2020. European Commission

differences by company size, sector and also by Member State. Enterprises were becoming more and more digitised, with large companies taking the lead. According to DESI index report, 38.5% of large companies relied already on advanced cloud services and 32.7% were using big data analytics. However, the vast majority of SMEs were not yet taking advantage of these technologies, with only 17% of them using cloud services and only 12% big data analytics. The best in class for these indicators are "Malta with 24% of companies using big data and Finland with 50% relying on cloud services. As for e-commerce, only 17.5% of SMEs sold online in 2019, following a very slight increase of 1.4 percentage points compared to 2016. In contrast, 39% of large enterprises made use of online sales in 2019. The top EU performers in the digitisation of businesses are Ireland, Finland, Belgium and the Netherlands"¹¹.

DESI 2020. European Commission

Integration of digital technologies. DESI EU



¹¹ DESI results:
<https://ec.europa.eu/digital-single-market/en/integration-digital-technology>

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A future strategy for the digital economy in the EU

For digital transformation, the Commission proposes an approach that includes all citizens and strengthens the digital economy around the concept of digital single market¹². As indicated, the European Commission has proposed a strategy based on the following pillars¹³ that we summarise here:

Technology that works for people

Development, deployment and uptake of technology that makes a real difference to people's daily lives. A strong and competitive economy that masters and shapes technology in a way that respects European values.

It involves the development of areas such as:

- Digital Skills & Jobs
- Artificial Intelligence, Cloud computing and Blockchain
- High-Performance Computing and Quantum Technologies
- Connectivity
- 5G and Internet of Things
- Cybersecurity
- Digital Inclusion
- Photonics and Electronics

An open, democratic and sustainable digital society

A trustworthy environment in which citizens are empowered in how they act and interact, and of the data they provide both online and offline. A European way to digital transformation which enhances our democratic values, respects our fundamental rights, and contributes to a sustainable, climate-neutral and resource-efficient economy.

Including actions on these topics:

- (Dis)information
- Media and Digital Culture

¹² <https://ec.europa.eu/digital-single-market/en>

¹³ <https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy>



- Trust and ePrivacy
- eHealth, eGovernment
- Smart Cities
- Safer Internet
- Women in ICT

A fair and competitive digital economy

A frictionless single market, where companies of all sizes and in any sector can compete on equal terms, and can develop, market and use digital technologies, products and services at a scale that boosts their productivity and global competitiveness, and consumers can be confident that their rights are respected. Topics included are:

- Data
- Online platforms and eCommerce
- Copyright
- Digitizing European Industry
- Start-Up Europe
- The Digital Economy and Society Index (DESI)

Europe as a global digital player

The EU is committed to setting global standards for emerging technologies and will remain the most open region for trade and investment in the world, provided that anyone who comes to do business here accepts and respects our rules.

Including areas such as:

- Foreign Policy
- Standardization
- Next Generation Internet

Digital Europe: Concrete actions 2021-2022

Already in June 2018, the European Commission proposed the creation of the Digital Europe program, as a new financing instrument dedicated to digitization as part of the next EU budget, the Multiannual Financial Framework (MFF) for 2021-27.

On February 13, 2019, the EU institutions reached a provisional agreement on the plan, excluding budgetary issues, and on April 17, 2019, the European Parliament approved the provisional agreement. While the negotiations of the next budget continue, the Commission has begun to prepare the implementation of this program.

An online survey¹⁴ has been run from July to October 2019, and anyone with an interest in the digital transformation of Europe's economy and society was encouraged to participate. The results of these consultations will all feed into the Commission's proposals and discussions on the Digital Europe work programme, which is due to begin in 2021.

In the framework of this consultation, some draft orientations to guide the preparation of the work programmes 2021-2022 were provided¹⁵. The programme proposes to fund activities which no Member State alone is able to implement, collective

action at European level is needed. They will reinforce the positive impact of Digital Single Market's policy achievements. Here a summary of the key guidelines in the document:

- *"Making Europe a top supercomputing region globally through the acquisition of at least one **exascale supercomputer** by the end of 2021, **upgrading existing supercomputers and extending the use of advanced computing to industry, including SMEs.***
- *Setting up and making accessible Europe-wide **data spaces** and **testing and experimentation** facilities for **artificial intelligence** in the areas of **health, environment/ climate, mobility, manufacturing and energy.***
- *Enhancing cybersecurity by deploying a **pan-European quantum communication infrastructure** and supporting the set-up of a **certification scheme for cybersecurity products.***
- *Addressing the shortages of digital experts in the EU through dedicated*

¹⁴ <https://ec.europa.eu/digital-single-market/en/news/consultation-future-investment-europes-digital-economy>

¹⁵ Digital Europe_ Draft Orientations for the preparation of the work programme(s) 2021-2022:

<https://ec.europa.eu/digital-single-market/en/news/consultation-future-investment-europes-digital-economy>

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Master's programmes for artificial intelligence, advanced computing and cybersecurity.

- Providing SMEs and public administrations access to the latest digital technologies by setting up a **network of Digital Innovation Hubs**.
- Ensuring a successful digital transformation of **health and care services** with the EU-wide deployment of innovative and cost-effective data-driven tools and services based on technologies like AI and data analytics.
- **Making ICT products and services sustainable**, by prioritising their energy efficiency as well as climate neutrality,

reparability, lifespan and recycling.

- Deploying open, interoperable, trustworthy **urban digital platforms** tailored to **communities' needs**, offering easy standardised access to new datasets, and the large scale roll-out of AI-driven services in Smart Energy, Smart Mobility, waste and secondary resource management, industry and (re)manufacturing, healthcare and e-government."¹⁶.

The European Commission also raises new initiatives to alleviate the consequences of COVID-19, a large part of them are reflected in the document "Europe's moment: Repair and Prepare for the Next Generation"¹⁷. The



¹⁶ Digital Europe_ Draft Orientations for the preparation of the work programme(s) 2021-2022:

<https://ec.europa.eu/digital-single-market/en/news/consultation-future-investment-europes-digital-economy>

¹⁷ Europe's moment: Repair and Prepare for the Next Generation, COM (2020) 456 final:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590732521013&uri=COM%3A2020%3A456%3AFIN>

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document considers that *"the pandemic and its consequences on our lives and economies have highlighted the importance of digitisation across all areas of EU economy and society. New technologies have kept our businesses and public services running, and made sure that trade could continue flowing. They have helped us all to stay connected, to work remotely and to support our children's learning"*.

Along with the importance of strategic digital capacities and capabilities, the document indicates four elements that will be key for a digital recovery, helping to stimulate competitive innovation and to provide users with greater choice:

1. investment in more and better connectivity, particularly the rapid deployment of 5G
2. the need a stronger industrial and technological presence in strategic parts of the digital supply chain
3. the need to build a real data economy as a motor for innovation and job creation
4. the need for a fairer and easier business environment, reducing administrative burden and making it easier for companies, especially SMEs, to use digital tools.

Conclusions

Digital Europe:
a more
sustainable,
civic and liveable
space for
coexistence

The European Union is aware of the strategic importance that the digital economy has acquired in our days, as a factor of competitiveness and growth. It is very positive to see that it raises a strategic commitment at the highest level for its promotion and a roadmap for its realization, but we must be aware that the United States and China have an advantage and show evidence of greater strength. The weaknesses and areas that need more attention (for example, the promotion of the digital transformation of SMEs) are clearly identified and the new Commission working period (2021-27), as a time frame, represents an opportune starting point, although large doses of agility and coordination are required by all the actors involved (public administrations at all levels, companies and citizens).

The emphasis on the digital citizens, both to involve them and to respect their rights, and also to train them at a time when digital skills will be key, shows a deep ethical and social commitment. This commitment is enlightened by the founding principles and fundamental values that govern the European Union, making Europe a more sustainable, civic and liveable space for coexistence, also in the digital world.



Key references

A European strategy for data, COM(2020) 66 final. https://ec.europa.eu/info/sites/info/files/communication-european-strategy-data-19feb2020_en.pdf

An SME Strategy for a sustainable and digital Europe, COM(2020) 103 final. https://ec.europa.eu/info/sites/info/files/communication-sme-strategy-march-2020_en.pdf

Brynjolfsson E and Kahin, B, eds. (2002). Understanding the Digital Economy. Massachusetts Institute of Technology, Cambridge, MA.

Digital Economy Report 2019 - Value Creation and Capture: Implications for Developing Countries (UNCTAD/DER/2019). https://unctad.org/system/files/official-document/der2019_en.pdf

Digital Europe_ Draft Orientations for the preparation of the work programme(s) 2021-2022: <https://ec.europa.eu/digital-single-market/en/news/consultation-future-investment-europes-digital-economy>

Europe's moment: Repair and Prepare for the Next Generation, COM(2020) 456 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590732521013&uri=COM%3A2020%3A456%3AFIN>

Expert Group on Taxation of the Digital Economy, European Commission, Brussels. http://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/gen_info/good_governance_matters/digital/general_issues.pdf

Shaping Europe's digital future, COM(2020) 67 final. https://ec.europa.eu/info/sites/info/files/communication-shaping-europes-digital-future-feb2020_en_3.pdf

White Paper on Artificial Intelligence - A European approach to excellence and trust, COM(2020) 65 final. https://ec.europa.eu/info/sites/info/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf

Estrategia Digital Europea. <https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy>

Mercado único digital. <https://ec.europa.eu/digital-single-market/en>

Tapscott, D. (1996). The digital economy: Promise and peril in the age of networked intelligence. New York: McGraw-Hill.



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