The EU approach to Digital transformation
Trustful, secure, wide outreach of benefits, respecting our values and our climate

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European Commission
Digitisation and Climate: The two key policy priorities

- President-elect Ursula von der Leyen political priorities

“ensure that Europe fully grasps the potential of the digital age and strengthens its industry and innovation capacity”

Strengthening Europe’s technological leadership and sovereignty.
A new Commission (2019-2024)

- A vice president for Digitisation and Competition

- A Commissioner for internal market
  - A large and complementary portfolio, digital, internal market, defence and space
  - with synergy opportunities: digital single market, digital economy and society, defence industry and space

- An ambitious mission
  - with specific objectives
    - enhance Europe’s technological sovereignty
    - lead the EU approach to Artificial Intelligence
    - build a single market for cybersecurity
    - contribute to a digital education action plan
    - ...

...
Digitisation: Slow and uneven adoption across Member States
There is progress but too slow VS competing economies

Evolution of composite index
The digital supply chain: Where does EU stand?

Data of 2018

Source: DECISION Etudes & Conseil
The future: Forging an EU approach to digital transformation

**Key change factors**

- Personalised medicine
- Precision agriculture
- Autonomous safe mobility
- Energy/Resource efficiency
- Climate/env control
- Higher productivity, Creativity

**Wide outreach**

- Security/Trust
- Sustainability/climate
- AI Ethical, inclusive

**Data, Accessible respecting privacy,**

- Connectivity Towards terabits/s

- Advanced computing (edge, Quantum, Neuromorph,..)

- Lower power, secure Components/systems

**Enablers**

- Needs a coherent approach Using all policy instruments

**Policy**

-……
The EU approach: A trustful digital transformation
benefitting the whole society and economy

• Digital sovereignty
  • Trustful AI that empowers, a strong digital supply chain, available, accessible Data spaces, Cybersecurity

• Digital for a stronger and resilient economy
  • Trustworthy digital solutions: Platforms, Blockchain, Digital Identity, ..
  • Wider uptake across the economy, Skills and talents

• Digital for society
  • Transformation of health, mobility, culture, education, governments,..
  • Tackling disinformation and safeguarding democracy

• Digital for planet
  • Green digital
  • Digital for “greening” the economy and society
A coherent approach combining all policy instruments

**First 100 days initiative**

- **Adapting the regulatory framework**
  - *Human centric & trustful AI*, safer web preserving our values,
  - Accessible Data, cybersecurity,...

- **Focused investments on High Impact Projects/initiatives**
  - Projects/initiatives at scale for leadership in the digital supply chain
    - Cover the whole chain from components to platforms and applications
  - Work in partnership with industry/academia and MSs
    - Public support focused on attracting private investments
  - Scaling up and reinforcing successful initiatives, build on our strengths
    - ECSEL, IPCEI, EuroHPC, 5G,
    - Address the whole innovation chain from basic research up to roll out

- **Complemented by bottom up schemes to spread innovation**
  - DIHs, Start ups and scale ups (EIC...)

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*European Commission*
What can we build on?

A digital single market, world class infrastructure, robust partnerships

- ECSEL, IPCEI, electronics strategy
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- Blockchain initiative
- FET flagships, FET open, EIC
- DEI: Digital Innovation Hubs
- CEF Digital Service Infrastr.
- AI action plan
- Big data, robotics
- PPPs
- 5G action plan
- EuroHPC, EPI
- Photonics PPP
- EIPs: AHAP, Smart cities...
- Cybersecurity strategy, centre

DSM

28 legislations
From connectivity to platforms
ECSEL: Example of a unique endeavour

Source: DECISION Etudes & Conseil
Data of 2018
ECSEL: Aligning our strategies, more than 5 B€ investment

- Tripartite PPP – Commission, Member States and industry
- Strategic mission to boost the maturing and uptake of highly innovative technologies for electronic components and systems
- From components to smart systems to CPS
- High leverage effect on EU contribution
- In first five years (2014-18)
  - 63 projects funded for 3.37 B€ of total costs and 822 M€ EU contribution

Sept. 2017
The IPCEI in microelectronics: A key achievement

- First ever Important Project of Common European Interest

- A possibility envisaged in the EU treaty to support strategic projects
  - Involving several MSs with high impact across the EU
  - From R&D down to first production facilities
  - Addressing a Market gap
  - Going beyond the limits of State Aid Guidelines

- More than 7 B€ of investments
  - Industry + MSs
  - Essential pillar for a whole supply chain
  - Builds on achievements in ECSEL (notably pilot lines)

- A key first milestone to build on for the future
Reversing the trend

Revenues of main EU semiconductor companies
# EVC* Implementation Plan

**A strategy for Electronics**

## Capitalize on STRENGTHS

| **Accelerate** innovation through cooperation across **value chains/networks**: automotive, industrial, health & care, aerospace/defence - (JU) |
| **Exploit capabilities in sensors, low-power and security for **IoT** and Industry 4.0 |

## Address WEAKNESSES

| Pool resources around **Design** to exploit IPs by lowering barriers for low-volumes |
| Task-force to increase supply of skilled **workforce** |
| Favour support to local **manufacturing** capacity (IPCEI) |

## Seize OPPORTUNITIES

| Leverage on strengths in low-power and embedded systems for **AI on the edge** |
| Create a EU platform for deployment of **next generation computing** (e.g. neuromorphic and quantum) |

## Minimize THREATS

| Program for EU autonomy in **strategic components** (defence, aerospace, security, HPC, etc) |
| Mechanism to scrutinize Foreign Direct Investments |

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* Electronics Value-Chains
A legal and funding agency created by the Council

- 28 Participating States + EU
- Site: Luxembourg
- Budget (2019-2020): ~1 Billion Euros (half from EU)
- Operational: 11/2018 to 2026

**Mission:** Establish an integrated world-class supercomputing & data infrastructure and support a highly competitive and innovative HPC and Big Data ecosystem

**The JU is already delivering!**

https://eurohpc-ju.europa.eu/
• *Top 10 supercomputers, performance in Pflops*
Digital Innovation Hubs
Spreading excellence and innovation outreach

- Digital Innovation Hubs in 2016-20
  - 500 M€ of investments
  - to bring latest technologies to all industries,
  - Focus on SMEs
  - Test before Invest

- By technologies
  - or application sectors

- More than 170 centres involved
  - Close to 5000 SMEs

- To be substantially scaled up in next MFF
  - Close to 900 M€ under DEP
EU AI Coordinated Plan: Joining forces

• Adapting the regulatory framework
  – Ethical AI by design, fundamental rights
  – High level Group of experts

• Reinforcing excellence
  – Networks of European AI research excellence centres
  – and a PPP on AI (building on SPARC and BDVA PPPs)

• Building capacities
  – World-reference testing facilities and computing capabilities
  – Fostering AI take-up through Digital Innovation Hubs
  – HPC and data
  – A European Data Space

• Adapting our workforce
  – Attracting talent and stimulating life-long learning

Towards a Common EU wide AI R&I Agenda
FET FLAGSHIPS and Large Research Initiatives

Boosting the delivery of cutting-edge technologies with game-changing effects

Graphene
- Started in 2013
- >10 years
- Long term
- Scientific & industrial research agenda
- Strategic alignment at EU, national & regional levels

Human Brain Project
- Started in 2013
- Driven by an ambitious vision
- Hundreds of researchers
- Large scale
- Strategic alignment at EU, national & regional levels

Quantum Technologies
- Started in 2018
- +€1 billion funding
- Strategic

“Future Batteries Technologies” Initiative
- Will start in 2020
DIGITAL IN THE NEXT MFF: OVERVIEW

Digital Europe: Capacities & roll out
1. High Performance Computing
2. Artificial Intelligence (AI)
3. Cybersecurity
4. Advanced digital skills
5. Digital transformation and interoperability

€9.2 billion

Connecting Europe Facility - Digital Connectivity
- 5G roll out
- BB 4EU, Connecting communities
- Synergies with Transport/Energy

€3 billion

Digital in Horizon Europe R&D&I
1. Digital under "global challenges"
   - Digital and industry cluster
   - Digital in other clusters - health, mobility, energy, environment,..
2. FET Open/proactive under EIC
3. Research Infra in Open Science

> Current budget (~14 B€)

Creative Europe MEDIA
- Distribution of works
- Creation

€1.1 billion
<table>
<thead>
<tr>
<th>Clusters</th>
<th>Areas of intervention</th>
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<tbody>
<tr>
<td><strong>Health</strong></td>
<td>* Health throughout the life course</td>
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<td>* Non-communicable and rare diseases</td>
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<td><strong>Tools, technologies and digital solutions for health and care</strong></td>
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<td></td>
<td>* Infectious diseases</td>
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<td>* Environmental and social health</td>
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<td>* Infectious diseases</td>
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<td>* Health care systems</td>
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<td><strong>Culture, creativity and inclusive societies</strong></td>
<td>* Democracy, transformations</td>
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<td>* Creativity</td>
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<td>* Cultural heritage</td>
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<td><strong>Civil Security for Societies</strong></td>
<td>* Disaster-resilient societies</td>
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<td>* Protection and Security</td>
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<td><strong>Cybersecurity</strong></td>
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<td><strong>Digital and Industry and Space</strong></td>
<td>* Manufacturing technologies</td>
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<td>* Advanced materials</td>
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<td></td>
<td>* Space</td>
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<td>* Circular industries</td>
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<td><strong>Climate, Energy and Mobility</strong></td>
<td>* Climate science and solutions</td>
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<td>* Energy systems and grids in energy</td>
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<td>* Communities and cities</td>
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<td>* Industrial competitiveness in transport</td>
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<td>* Smart mobility</td>
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<td><strong>Food, bioeconomy, natural resources and environment</strong></td>
<td>* Environmental observation</td>
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<td>* Agriculture, forestry and rural areas</td>
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<td>* Food systems</td>
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<td>* Circular systems</td>
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<td><strong>Flagship</strong></td>
<td>* Key digital technologies</td>
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<td></td>
<td>* AI &amp; Robotics</td>
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<td>* Advanced computing, BD</td>
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<td>* Next generation internet</td>
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<td><strong>Energy supply</strong></td>
<td>* Buildings and industrial facilities</td>
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<td>* Clean transport and mobility</td>
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<td>* Energy storage</td>
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<td><strong>Biodiversity and natural capital</strong></td>
<td>* Sea and oceans</td>
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<td></td>
<td>* Bio-based innovation systems</td>
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Digital Europe programme – what?
Reinforcing digital capacities. Ensuring their best use.

- Advanced digital skills: 0.7 € billion
- Cybersecurity & trust: 2 € billion
- Digital transformation & Interoperability: 1.3 € billion
- High performance computing: 2.7 € billion
- Artificial intelligence: 2.5 € billion

Total: € 9.2 billion
Co-investing with MS in high-end infrastructures
- In partnership with industry

Reinforcing existing MS capacities, networking and aggregating – making them available across the EU

Ensuring best use of capacities in public sector & industry
Complementarities with other programmes supporting digital

- Digital Europe: Capacities & roll out
- Digital in Horizon Europe R&D&I
- Connecting Europe Facility - Digital Connectivity
- Creative Europe MEDIA

European Regional Development Fund / Cohesion Fund

Invest EU Research, innovation & digitisation
Refocusing our partnerships

• A more limited set of strategic partnerships
  – Strategic roadmaps from R&D to deployment
  – Making use of the wider spectrum of financing (HE, DEP, etc..)
  – Clear commitment from partners

• Institutional Partnerships for digital sovereignty
  • Key Digital technologies, from semiconductors to software
  • High Performance and advanced computing (exa-scale and quantum)
  • Smart connectivity (Beyond 5G, ...)
  • Cybersecurity Centre (Shielding EU economy and society)

• Limited set of co-programmed partnerships
  – AI, Photonics
  – Manufacturing
From ECSEL to the new KDT

Data of 2018

Source: DECISION Etudes & Conseil
Think ‘high impact projects/initiatives’: e.g. in AI

**Artificial Intelligence: Common Data Spaces**

**Target:** collaborative, simple, scalable, secure and trusted infrastructures and platforms to pool large data spaces for societal/industrial priorities

**Deliverables:** An AI compute infrastructure using HPC, Meta data standards, APIs and full service platforms enabling easy aggregation of large data sets for AI applications in key areas

**Who benefits:** businesses, notably SMEs & start-ups will develop AI applications using data available in key areas e.g. Health, Environment, Manufacturing, mobility, agriculture,..

**Financing:** DEP, Member States, private sector, HE
Example of high impact projects/initiatives in AI

Artificial Intelligence: World class reference testing and experimentation facilities

**Target:** Attracting investments and talents through world class reference sites in the EU for experimentation and real life testing of AI in health, mobility, security, finance, etc...

**Deliverables:**
- Leading edge, real scale testbeds in
  - Autonomous mobility (vehicles, shipping, rail...)
  - Smart & clean factories (from digital twins to safe robotics)
  - Precision agriculture (smart farming, drones, etc.)
- ...

**Who benefits:**
Sites will be open to all businesses and public stakeholders. Built in partnership with private sector and connected to the Network of Digital Innovation Hubs.

**Financing:**
- DEP,
- ERDF,
- Invest EU,
- Member States,
- private sector

**Testing latest AI technologies including deep learning, robotics, edge and neuromorphic computing,**
e.g. Next generation low power and highly secured processor technologies

**Target:** Ensure the build-up of a strong industrial supply of advanced microprocessors in Europe targeting Edge and High Performance computing.

**Deliverables:** World leading, competitive, low power processor technology for artificial intelligence to be designed & produced in Europe

**Who benefits?** All business sectors and also public sector including notably for security and safety. Essential for deployment of AI and edge computing in automotive, energy, healthcare and other core sectors.

**Building on success of EuroHPC and ECSEL, from 2021, a European Low power microprocessor initiative with support from Horizon Europe and DEP**
By joining effort, we can build the world’s most powerful digital ecosystem

We can build our technology sovereignty and shape the digital transformation in line with our values

We can advance the technology, reinforce our capacities & apply them for the benefits of our citizens and businesses

Investment from basic research to deployment

Seizing the opportunities arising in: AI, Data, Quantum, edge computing, lower power, trustful software and hardware...

Hope we can count on you!
Thank You!