Horizon Europe
Digital Europe
"INNOVATE OR DIE"

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Europe has an innovation deficit

Europe is a global scientific powerhouse. It has all the necessary ingredients to shape a prosperous and safe future but it does not capitalise enough on the knowledge it has and produces.

"Lab-Fab-App: Investing in the European Future We Want"

European Commission

FP7 - The Seventh Framework Programme for
Research and Technological Development

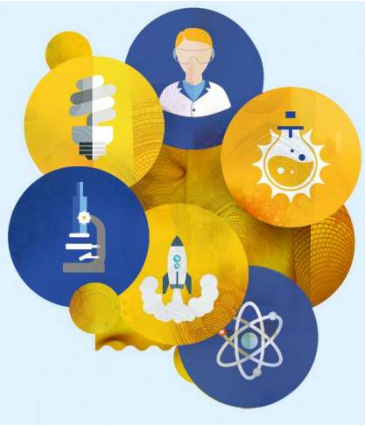
Horizon 2020 - The EU Framework Programme for
Research and Innovation

The future

Horizon Europe

Research and Innovation funding programme

- **to strengthen the EU's scientific and technological bases**
- **to boost Europe's innovation capacity, competitiveness and jobs**
- **to deliver on citizens' priorities and sustain our socioeconomic model and values**



Digital Europe

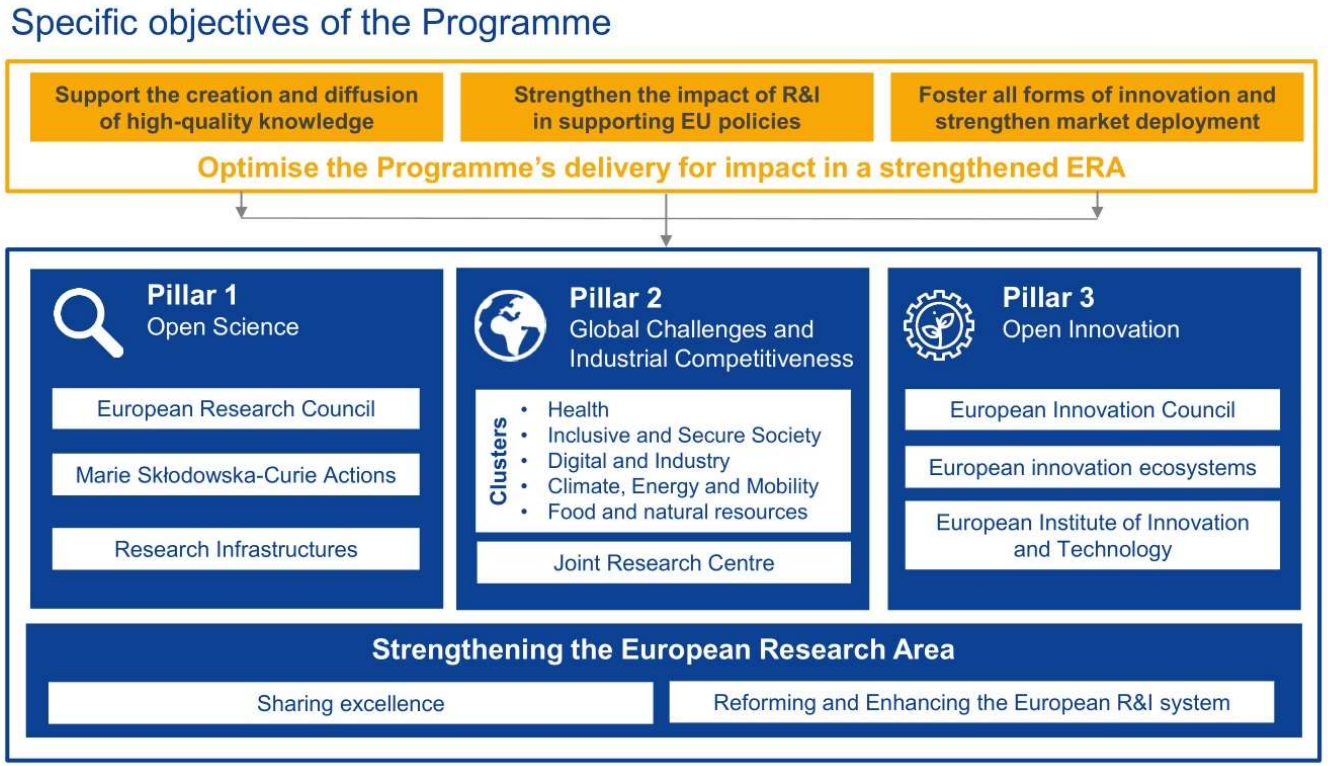
Funding programme for digital technologies to increase EU's international competitiveness, develop and reinforce Europe's strategic digital capacities. Focused on five areas:

- **Supercomputers**
- **Artificial intelligence**
- **Cybersecurity and trust**
- **Digital skills**
- **Ensuring a wide use of digital technologies across the economy and society**

European Commission

From the standard Horizon Europe presentation

Horizon Europe: evolution not revolution



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European Commission

Lessons Learned
from Horizon 2020 Interim Evaluation

Key Novelties
in Horizon Europe

Support breakthrough innovation	European Innovation Council
Create more impact through mission-orientation and citizens' involvement	R&I Missions
Strengthen international cooperation	Extended association possibilities
Reinforce openness	Open science policy
Rationalise the funding landscape	New approach to Partnerships

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European Innovation Council

Support to innovations with breakthrough and disruptive nature and scale up potential that are too risky for private investors.

European Innovation Council

Helping innovators create markets of the future, leverage private finance, scale up their companies,

Innovation centric, risk taking & agile, pro-active management and follow up

Two complementary instruments bridging the gap from idea to investable project

Pathfinder: grants
(from early technology to pre- commercial)

Accelerator:
grants & blended finance
(from pre-commercial to market & scale-up)

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R&I Missions

R&I Missions

Relating EU's research and innovation better to society and citizens' needs; with strong visibility and impact

A mission is a portfolio of actions intended to achieve **a bold and inspirational as well as measurable goal** within a set timeframe, with impact for science and technology, society and citizens that goes beyond individual actions

Horizon Europe proposal defines mission characteristics and elements of governance

Specific missions will be **co-designed with Member States, stakeholders and citizens** and programmed within the Global Challenges and Industrial Competitiveness pillar (drawing on inputs from other pillars)

International Cooperation

International Cooperation

Tackling together global societal challenges; access to the world's best talents, expertise and resources; enhanced supply and demand of innovative solutions

Extended openness to association

- Third countries with good capacity in science, technology and innovation
- Taking into account objective of driving economic growth in Europe through innovation

- General opening for international participation
- Intensified targeted actions
  (flagship initiatives, joint calls, etc.)

Open Science across the programme

Open Science

Better dissemination and exploitation of R&I results and support to active engagement of society

- **Mandatory Open Access to publications:** beneficiaries must ensure the existence of sufficient rights to comply with open access requirements
- **Mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Re-usable) and Open Research Data :** for all research data with possibilities to opt-out from open access requirements

- Support to researcher skills in and reward systems for open science
- Use of European Open Science Cloud

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New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- **Simple architecture and toolbox**
- **Coherent life-cycle approach**
- **Strategic orientation**

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised

Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe

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Pillar 1

OPEN SCIENCE:

reinforcing and extending the excellence of the Union's science base

European Research Council

- Frontier research by the best researchers and their teams

€ 16.6 billion

Marie Skłodowska-Curie Actions

- Equipping researches with new knowledge and skills through mobility and training

€ 6.8 billion

Research Infrastructures

- Integrated and inter-connected world-class research infrastructures

€ 2.4 billion

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Pillar 2

Global Challenges & Industrial Competitiveness:

boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals

Clusters implemented through usual calls, **missions & partnerships**	Budget (€ billion)
Health	*€ 7.7*
Inclusive and Secure Society	*€ 2.8*
Digital and Industry	*€ 15*
Climate, Energy and Mobility	*€ 15*
Food and Natural Resources	*€ 10*
Joint Research Centre supports European policies with independent scientific evidence & technical support throughout the policy cycle	€ 2.2

Clusters in 'Global Challenges and Industrial Competitiveness'

Clusters	Areas of intervention	
Health	* Health throughout the life course * Non-communicable and rare diseases * Tools, technologies and digital solutions for health and care	* Environmental and social health determinants * Infectious diseases * Health care systems
Inclusive and Secure Societies	* Democracy * Social and economic transformations * Protection and Security	* Cultural heritage * Disaster-resilient societies * Cybersecurity
Digital and Industry	* Manufacturing technologies * Advanced materials * Next generation internet * Circular industries * Space	* Key digital technologies * Artificial intelligence and robotics * Advanced computing and Big Data * Low carbon and clean industry
Climate, Energy and Mobility	* Climate science and solutions * Energy systems and grids * Communities and cities * Industrial competitiveness in transport * Smart mobility	* Energy supply * Buildings and industrial facilities in energy transition * Clean transport and mobility * Energy storage
Food and Natural Resources	* Environmental observation * Agriculture, forestry and rural areas * Food systems * Circular systems	* Biodiversity and natural capital * Sea and oceans * Bio-based innovation systems

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Pillar 3

OPEN INNOVATION:

stimulating market-creating breakthroughs and ecosystems conducive to innovation

European Innovation Council

- Support to innovations with breakthrough and market creating potential

European innovation ecosystems

- Connecting with regional and national innovation actors

European Institute of Innovation and Technology (EIT)

- Bringing key actors (research, education and business) together around a common goal for nurturing innovation

€ 10.5 billion, incl. up to € 500 million for ecosystems

€ 3 billion

European Commission

The future: Horizon Europe & Digital Europe

- Strategic investment
- Tech for the society
- Embrace and steer innovation

2021-2027 budget
(Multiannual Financial Framework)

Digital and Industry Cluster *(part of **Horizon Europe**)*	Manufacturing technologies Advanced materials Space Circular industries **Key digital technologies** *(photonics, microelectronics, software)* **Artificial intelligence and robotics** **Advanced computing and Big Data** **Next generation internet**
Digital Europe Programme	Deployment of capacities & interoperability Capacity building **High-Performance Computing** **Artificial Intelligence** **Cybersecurity** **Advanced digital skills**

Total R&I investment:
114.2B€

Digital Europe

Investments for

- **building and reinforcing** the capacities and infrastructures
- for EU-wide best use of **AI, HPC and cybersecurity,**
- including the availability of the relevant **advanced skills**.

Focus will be on **high impact projects**
Digital Innovation Hubs will play an important role in widening the benefits of digital technologies across all regions of the EU

The selection of focus areas is guided by policy objectives.
They include the **2018 European strategy for Artificial Intelligence** and the relevant **Coordinated Action Plan**, which both emphasise the need to develop and deploy AI in line with fundamental rights, the revised **European cybersecurity strategy** announced in 2017 and the **EuroHPC initiative** and take into account the climate and environmental impacts where relevant.

European Commission

Digital Europe

Key objectives

Building essential digital capacities
- HPC
- Cybersecurity
- Artificial Intelligence

Co-investing with Member States on new high end infrastructures
- HPC for exascale
- Quantum-communication based cybersecurity shield
- AI data spaces for health, industry, climate science, mobility and environment + highly relevant real scale testing facilities in the areas of healthcare, sustainable low carbon, agriculture, climate, environment, energy, manufacturing and transport

Upgrading and consolidating available capacities at EU or Member State level
- Networking and upgrading of computing centers
- Reinforcement and federation of national infrastructures
- Opening AI testbed facilities to EU actors
- AI focused computing paradigms, AI in industrial context
- Green ICT solutions

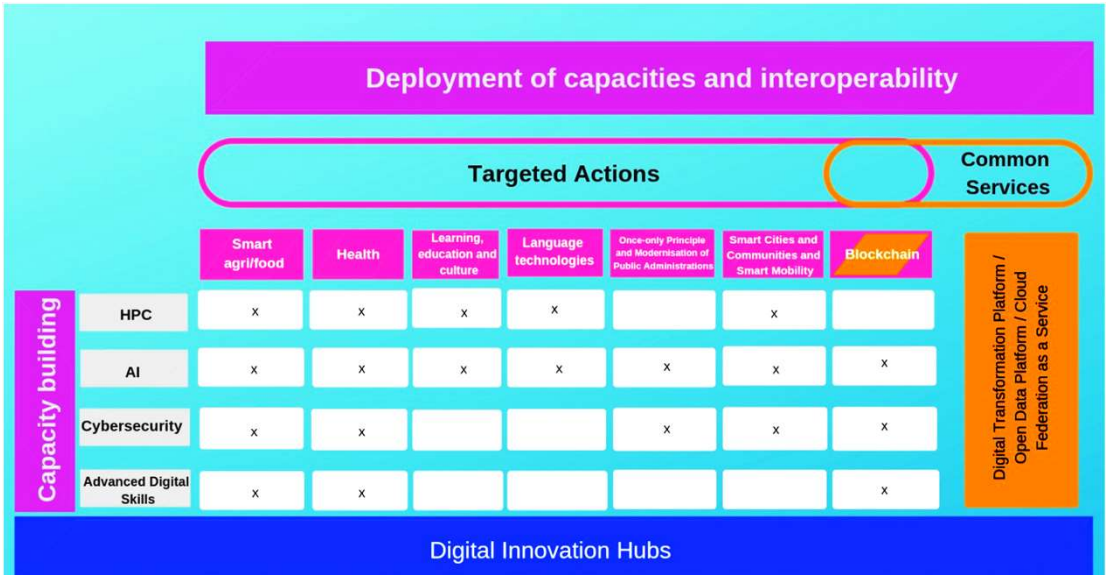
Digital Europe

Key objectives

Developing advanced digital skills
- design and set up of specialised master programmes or modules,
- financing for short-term training courses and job

Accelerating the best use of technologies
- Aiming for high-impact deployment (health, urban environment, public services)
- Widening the best use of digital technologies (security and trust, culture, education, Digital Innovation Hubs)

Exploit interdependencies



Digital Innovation Hubs

- Setting up an initial network of European DIHs
- Early stages of the network's expansion
- The aim: one hub per NUTS2 region including outermost

Each DIH will have a specialisation (combining AI, HPC, Cybersecurity) and will have experimentation facilities related to its specialisation which can be used by companies and the public sector to test these
technologies including their environmental impact where relevant before further investing in it.
Appropriate coverage of AI, HPC and cybersecurity, will be ensured

Useful links

Digitising European Industry
http://ec.europa.eu/digital-agenda/en/digitising-european-industry
https://ec.europa.eu/digital-single-market/en/advanced-computing
https://ec.europa.eu/digital-single-market/en/cyber-physical-systems

Horizon 2020:
http://ec.europa.eu/research/horizon2020/index_en.cfm
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ict-01-2019
https://ec.europa.eu/digital-single-market/events/cf/ict2018/item-display.cfm?id=22784

Horizon Europe proposal:
https://ec.europa.eu/info/designing-next-research-and-innovation-framework-programme/what-shapes-next-framework-programme_en

Digital Europe proposal:
https://ec.europa.eu/digital-single-market/en/news/commission-welcomes-agreement-digital-europe-programme-2021-2027