UKRO Horizon 2020 Condensed

Information and Communication Technologies (ICT) in Leadership in Enabling and Industrial Technologies (LEIT)

What is ICT in LEIT?

Funding opportunities for ICT span the entirety of Horizon 2020, including activities in all three pillars on Excellent Science, Industrial Leadership and the Societal Challenges. For example, there are ICT contributions to topics in the Work Programme parts on Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing, Societal Challenge 1 (Health, demographic change and wellbeing), Societal Challenge 2 (Sustainable Food Security), Societal Challenge 7 (Secure societies – Protecting freedom and security of Europe and its citizens), and the cross-cutting areas (Internet of Things, Industry 2020 in the Circular Economy – Factories of the Future). Because of the radical changes induced by ICT in our lives, the cross-cutting issues of responsible research and innovation, on the one hand, and of social sciences and humanities, on the other hand, are also addressed. The largest part of ICT activity is concentrated within the Leadership in Enabling and Industrial Technologies part of the Work Programme. Broadly speaking, the main areas of activity within this part of the 2018-2020 work programme are as follows:

Technologies for Digitising European Industry	European Data Infrastructure: HPC, Big Data and Cloud Technologies	5G
Next Generation Internet	Cross-cutting activities	Other actions, including prizes
EU Joint Calls with Japan, Korea	Cybersecurity	Digitising and transforming European Industry and services: digital innovation hubs and platforms
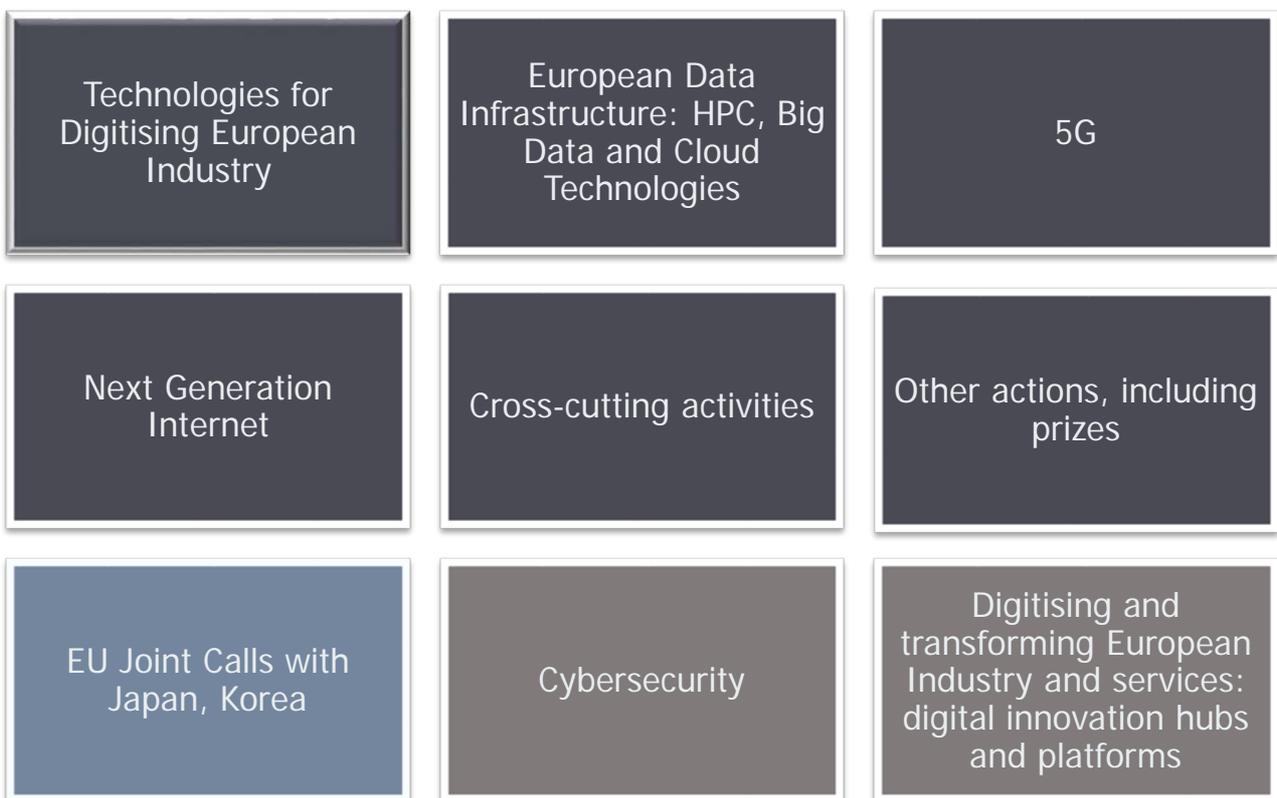
What will be funded?

The following table provides an overview of some of the main ICT areas covered in 2019 and 2020; for a full description, please consult the Work Programme.

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A new generation of components and systems

- Reinforcing EU stronghold positions in electronics, microsystems and embedded systems
- Broad range of system level integration from miniaturised smart components and large area organic electronics to cyber-physical systems and systems of systems

Advanced Computing and Cloud Computing

- Design, programming and implementation of advanced low power and customised computing as well as Cloud Computing infrastructures and services

Future Internet

- Focus on: networks (see 5G PPP industry roadmap), software technologies, experimentation in large-scale or real-life environments, innovation (e.g. web entrepreneurship)

Content Technologies and Information Management

- To foster advances along three ecosystems: data value chain (big data), content value chain (creative, social media and convergence industries), knowledge value chain (advanced knowledge and learning technologies)

Robotics and Autonomous Systems

- Technical capabilities targeted: systems development, interaction, mechatronics and perception/navigation/cognition
- Systems abilities targeted: configurability, adaptability, interaction capability, dependability, motion capability, manipulation and grasping, perception, decisional autonomy and cognitive ability

Micro- and nano-electronic technologies, Photonics

- Photonics KET: to address the whole research and innovation value chain in photonics technology (see NMBP Work Programme part and Factories of the Future PPP for laser-based manufacturing processes)
- Micro- and nanoelectronic technologies KET: generic technology development for continued shrinking of horizontal and vertical physical feature sizes (see also ECSEL JTI for research and innovation covering Technology Readiness Levels 3 to 8)

Several of the above areas are linked to Public-Private Partnerships (PPPs), instrumental in the development of call topics. The most important PPPs for the purposes of this ICT Work Programme part are the following: 5G PPP; Big Data PPP; Photonics PPP; Robotics PPP (SPARC) and AI PPP. Other PPPs with ICT-related subjects are those for High-Performance Computing, Factories of the Future, Cybersecurity (which was new for 2017) though the relevant topics are to be found elsewhere in Horizon 2020. Of particular interest to ICT is also the High Performance Computing Joint Undertaking that has been in place since the end of 2018. Applicants are encouraged to refer to publicly available strategic research agendas/roadmaps in order to gain a better understanding of the rationale behind the topics.

Further funding is allocated to dedicated topics on 'innovation and entrepreneurship support', as well as 'responsibility and creativity' at the nexus of technology arts, humanities and the social sciences. The international dimension of ICT activities has been reinforced through joint calls with Brazil, Japan, South Korea and Taiwan on specific topics, a targeted call to help build partnerships with sub-Saharan Africa and ASEAN countries, as well as additional support actions towards improved co-operation with China and Mexico.

2018-2020 Work Programme

The 2018-2020 Work Programme Information and Communication Technologies (ICT), published by the European Commission, contains the following priorities.

AI & Technologies for Digitising European Industry and Economy

- Establish next generation digital platforms and rebuild the underlying digital supply chain on which all economic sectors are dependent
- Enable all sector and application areas to adapt,, transform and benefit from digitisation
- Support to Microelectronics, in particular for higher TRLs, through the ECSEL JU

European Data Infrastructure: HPC, Big Data and Cloud Technologies

- Support the creation of a European Data Infrastructure and a European Data Economy, complementing the relevant activities in the e - Infrastructures and FET WPs.
- Enable the creation of a world - HPC/BD ecosystem based on European leadership in HPC, Cloud and Big Data technologies.

5G

- Phase 3 of 5G cPPP, targeting validation of of R&I on technologies and architectures for 5G
- Support EU 5G policy as outlined in the context of the 5G Action Plan whilst implementing the last phase of the 5G cPPP roadmap
- China and Taiwan collaboration

Cybersecurity

- Dynamic countering of cyber-attacks
- Building blocks for resilience in evolving ICT systems
- Advanced cybersecurity and digital privacy technologies
- Quantum key distribution testbed

Next Generation Internet (NGI)

- Focus on future interactive technologies, advances in AI, IoT, future social networks, media and platforms as well as language technologies, forming a coherent and integrated package of topics

Cross-cutting activities

- Better address innovation in industry and society by engaging artists in European R&I projects through STARTS lighthouse pilots
- Startup Europe for Growth and Innovation Radar
- Enable public procurers to collectively implement PCPs in order to close the gap between supply and demand for innovative ICTs

Digitising and Transforming European Industry and Services

- Projects cutting across technological boundaries and reinforcing links between LEIT and Societal Challenges.
- Two types of activities:
  - Digital innovation hubs
  - Cross-sectorial and integrated digital platforms and large scale pilots

For the 2020 ICT Work Programme part, the areas of Artificial Intelligence (AI), key technologies for digital transformation (ranging from photonics to software), 5G advanced and smart connectivity and Next Generation Internet are prioritised.

Call information and timings

Notable calls opening in July 2019 include a call towards a vibrant European network of AI excellence centres, a crosscutting activity on international ICT standardisation, as well as additional topics on 5G, Next Generation Internet and AI for manufacturing and software technologies. These calls have deadlines either in November 2019 or January 2020. Most of the other ICT calls open in November 2019 with a deadline for applications in April 2020. International cooperation activities focus on a call building partnership between European and African innovation hubs.

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Relevant EU policy areas and developments

The Horizon 2020 Work Programme 2018-2020 has been aligned with the agenda of the European Commission, which took office in November 2014 and identified a set of ten priorities and three pillars, with Horizon 2020 calls contributing to one or more of these policy areas. The most important ones in the areas of ICT are those relating to 'Jobs, Growth and Investment' and the 'Digital Single Market'.

The European Commission Communication 'A Digital Single Market Strategy for Europe', sets out a series of key actions the European Commission aims to deliver. In the area of big data, the European Commission's thinking is set out in a Communication on a data-driven economy (July 2014), which sets out operation conclusions to support and accelerate a transition towards it. The European Commission's announcement on the European Cloud Initiative (April 2016) also influenced the content and development of the 2018-2020 work programme.

The Commission published the mid-term review of its Digital Single Market strategy in 2017, taking stock of the progress made and outlining further actions on online platforms, data economy and cybersecurity. The European Digital Progress Report, gives an in-depth assessment of how the EU and Member States are progressing in their digital development. Important policy areas critical for unlocking the true value of the data economy are identified around digital skills, digitising industry, high performance computing, artificial intelligence (see EU Declaration on Cooperation on AI in 2018), modernising public services and e-government, as well as health and care.

Actions foreseen in the 2020 part of the work programme are strategic stepping stones towards the Horizon Europe framework programme and aim to support Europe in taking a bold lead in digital technologies by 2030. They also build ground for wide-spread deployment of digital technologies and thus provide means to respond to the challenge of digital transformation in line with the objectives of the proposed Digital Europe programme.

More information:

- European Commission Research and Innovation Participant Portal for:
  - Calls for proposals **https://ec.europa.eu/info/funding-tenders/opportunities/portal/**
  - 2018-2020 Work Programme **ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-leit-ict_en.pdf**
- European Commission Horizon 2020 website: **ec.europa.eu/programmes/horizon2020**
- Information on the Digital Single Market priority: **ec.europa.eu/priorities/digital-single-market/**
- Communication on the data-driven economy: **ec.europa.eu/digital-agenda/en/news/communication-data-driven-economy**
- Communication on the European Cloud Initiative **ec.europa.eu/digital-single-market/en/%20european-cloud-initiative**
- Digital Single Market Mid-term Review: **Commission calls for swift adoption of key proposals and maps out challenges ahead**
- Transformation of **Health and Care in the Digital Single Market**
- **High Performance Computing** in the Digital Single Market
- European Commission Communication on **A European approach to Artificial Intelligence**
- Sign up to the UKRO Portal to stay up to date on Horizon 2020 general developments, calls, events and results: **ukro.ac.uk**
- For specific questions, contact your UKRO European Advisor.