**Digital Single Market**

On 19 April, the European Commission presented a Communication on “Digitising European industry: reaping the full benefits of a Digital Single Market”. It proposes to “reinforce the EU’s competitiveness in digital technologies” and at the same time “to ensure that every industry in Europe, in whichever sector, wherever situated, and no matter what size, can fully benefit from digital innovations”. In the Communication, the Commission proposes to act in the following areas:

* Setting a framework for coordination of initiatives, with a catalogue of national and regional initiatives and priorities, a High-Level Roundtable organised twice a year with representatives of Member States’ Initiatives, industry leaders (including leaders of the Public Private Partnerships - PPPs) and social partners, and a yearly European Stakeholder Forum.
* Boosting Europe’s digital innovation capacities, with a focus on:
  + deployment of Digital Innovation Hubs across Europe, to facilitate the penetration of digitisation in all sectors, all company sizes and all regions, supported by €500 million from the Horizon 2020 programme over the next five years; a thematic smart specialisation platform for industrial modernisation will be launched in June
  + coordination between all digital-sector PPPs, the launch of a European Cloud Initiative and of initiatives supporting the building of digital industrial platforms of the future (areas: IoT, data platforms, connected smart factory, connected and automated driving…): the purpose is to reinforce the role of PPPs as coordinators on EU-wide R&I efforts and national and industrial initiatives, as well as to focus a significant part of the PPPs and national investments on cross-sectoral and integrated digital platforms and ecosystems
  + prioritisation of standardisation efforts in the areas of reference architecture and experimentation: an accompanying Communication identifies five priority areas: 5G, cloud computing, the IoT, data technologies and cybersecurity (see below).
* Providing the appropriate regulatory framework conditions with the use of the REFIT instrument and a cautious approach to new legislation; the following actions are foreseen: an initiative on the free flow of data, an examination of the emerging issues of data ownership, an exploration of the legal frameworks of autonomous systems and IoT applications, and initial work on the safety of apps and other non-embedded software not covered by sectoral legislation
* Supporting the acquisition of necessary digital and complementary skills (action in this area will be proposed in an upcoming Commission Communication on a “New Skills Agenda for Europe”).

The Communication is supplemented by a number of accompanying documents:

1. A Communication on Priorities for ICT Standardisation
2. A Communication on a European Cloud Initiative, accompanied by two staff working documents on High-Performance Computing and on Quantum Technologies.
3. A E-Government action plan
4. A staff working document on the Internet of Things.
5. **Standards**

In the Communication on Priorities for ICT Standardisation, the Commission identifies a set of five priority areas and proposes a high-level political process to validate, monitor and possibly amend this list.

**On cloud computing**, the Commission intends to support funding the development of standards improving the interoperability and portability of the cloud, to support the finalisation of international standards on service level agreements (by mid-2017) and to request European Standardisation Organisations (ESOs) to update the mapping of cloud guidelines for end users.

**On the Internet of Things (IoT)**, the Commission will work with the ESOs, international standardisation organisations and the Alliance of IoT Innovation (AIOTI) to encourage the development of an interoperable environment, targeting reference architectures, protocols and interfaces, the promotion of open application programming interfaces

(APIs) and, if necessary, address identified interoperability failures by using legal measures recommending appropriate standards. It will also promote an interoperable cross-border IoT numbering space and an open system of object identification and authentication. The Commission will explore options for trust, privacy and end-to-end security by promoting a “trusted IoT label”. Finally, it will encourage the uptake of IoT standards in public procurement, notably in the areas of smart city services, transport and utilities (including water and energy).

**Regarding 5G communication networks**, the Commission will develop an Action Plan for the deployment of 5G networks beyond 2020, promote the emergence of international industry standards under EU leadership, building on the dissemination of the 5G Public Private Partnership outcome in specialised international bodies, and ensure that industries with sector-specific needs can as early as 2016 participate more directly in 5G standardisation organisations.

**On cybersecurity**, the Commission will promote security-by-design principles by promoting the development by the ESOs, other standardisation bodies and stakeholders of practical guidelines covering IoT, 5G, Cloud Computing, Big Data and Smart Factory. A Commission Recommendation could be adopted by the end of 2017. The Commission will also invite the ESOs, other standardisation bodies and stakeholders to develop standards supporting global interoperability and trustworthy identification based on comparable trust models. Finally, it will support the development of standard-based cybersecurity risk management guidelines and audit guidelines.

**On data**, the Commission intends to increase R&D&I investment specifically for data interoperability and standards as of 2016, notably regarding cross-sectoral data integration and better operability of data and associated metadata. It will also use the Big Data Value Public Private Partnership to bring the European data community together, with the aim of identifying missing standards and design options for a big data reference architecture by 2018. Finally, it will support standard software data infrastructure services for access to and long-term preservation of scientific data.

To ensure a **high-level commitment** to deliver and ensure leadership through standards, the Commission plans to launch as of 2017 a regular inter-institutional dialogue on European standardisation, highlighting ICT priorities in order to take stock of progress and, where necessary, adapt the priorities. Such a dialogue will be included in the upcoming Joint Initiative on Standardisation. The Commission will work in collaboration with stakeholders on the identification by 2017 of possible measures to

1. improve accessibility and reliability of information on patent scope, including measures to increase the transparency and quality of standard essential patent declarations,
2. clarify core elements of a licensing methodology around FRAND (fair, reasonable, and non-discriminatory) licensing terms and
3. facilitate the efficient and balanced settlement of disputes. As of mid-2016, the Commission will also investigate possibilities for setting up and funding supporting mechanisms to strengthen European participation in global standards setting by monitoring global standardisation activities in the ICT domain, and support the wider participation of European experts.
4. **Communication on a European Cloud Initiative**

In this Communication, the Commission proposes an ambitious €6.7 billion plan to implement a European Open Science Cloud, aimed at offering the EU scientific and technology community a virtual environment to store, share and reuse their data across disciplines within the EU. This will be supported by the creation of a European data infrastructure (with high bandwidth networks, large-scale storage facilities and super-computer capacity). A calendar of actions is foreseen as follows:

* 2016: creation of a European Open Science Cloud for European researchers: integration and consolidation of e-infrastructure platforms, federation of existing scientific clouds and research infrastructures, and support for the development of cloud-based services
* 2017: **opening up by default of all scientific data** produced by future projects under Horizon 2020
* 2018: launching of a flagship-type initiative to accelerate the nascent development of **quantum technology**
* By 2020: development and deployment of a large-scale **European high performance computing, data storage and network infrastructure**, including the acquisition of two prototype next-generation supercomputers, the establishment of a European big data centre, and upgrading of the backbone network for research and innovation (GEANT).

The objective is that, in addition to the European research community, the European Open Science Cloud and the European Data Infrastructure will be accessible to **Businesses, Industry, SMES and Public services**.

1. **E-Government action plan (2016-2020)**

In its third e-Government action plan (previous ones covered the periods 2006-2010 and 2011-2015), the Commission proposes that public administrations and institutions in the EU become by 2020 “open, efficient and inclusive, providing borderless, personalised, user-friendly, end-to-end digital public services to all citizens and businesses in the EU”. Twenty actions are proposed, including modernisation of existing legislation, to be implemented in 2016 and 2017 with the goals of a) modernising public administration with ICT, using key digital enablers, b) enabling cross-border mobility with interoperable digital public services and c) facilitating digital interaction between administrations and citizens/business for high quality public services. An e-Government Action Plan Steering Board will be put in place, chaired by the Commission and composed of Member States’ representatives.

1. **Commission Staff working document on “Advancing the Internet of Things in Europe”**

Building on a number of studies and consultations carried out in recent years, the document lists the challenges and risks facing Europe’s industry in this area and offers an analysis of what actions would be required for the EU to become a leading region of the world in IoT products and services. These actions are grouped under three pillars: a single market for the IoT, a prosperous IoT eco-system, a human-centred IoT.

A single market for the IoT will require connectivity (spectrum and network coverage) and a reference architecture, as well as answers to issues such as numbering and addressing, identification and discovery, telecommunication networks, data flow and liability (safety aspects).

A prosperous IoT requires that both horizontal (cross-industry sectors, to avoid fragmentation between industrial or domain-specific applications) and vertical (specific sector) dimensions are taken into account. The Commission lists interoperability, ubiquity, end-to-end security and trust as specific policy challenges to be addressed. It will launch several cross-sectoral initiatives to promote open platforms, where European companies should strive for leadership. The Commission points to a series of lead markets where the European industry could find opportunities for development.

A human centred IoT requires the application of a number of guiding principles to avoid that human beings become “hostages” of technology. Process of personal data is protected by Directive 95/46/EC on Data Protection, to be replaced as of 2018 by the General Data Protection Regulation which promotes techniques to protect personal data (“anonymisation”, “pseudonymisation”, encryption). The central question is that of trust in the IoT, and a “Trusted IoT label” could be developed for consumer products, complementing the upcoming directive on Network Information Security. The issues of authentication and certification of networked devices should also be addressed to tackle security aspects.