

Annex I – Background

Meeting [REDACTED] – Commissioner Oettinger (Basis 5059)

Digital Single Market

Facts and figures

- Europe's ICT sector represents more or less the same proportion as in the US economy, at 4 & 5% of GDP respectively (2010 data), which is small compared to the overall economy. However, when taking into account the contribution of ICT in other sectors of the economy, this figure can go as high as 14% in the US and above 7% in the EU. Moreover, 41% of GDP growth in the US in 1995-2007 was led by ICT & complementary investments. The contribution in the EU was only 34%.
- The vast majority of major players in the digital economy are US corporations: 31 of the top 50 Internet public companies in 2011 were US-based and only 7 were EU-based. Europe is still a leader in some ICT sectors like robotics and embedded systems (31% of world market share in the latter).
- Europe has all the assets to succeed in the global digital economy. EU industry has created plenty of regional-scale enterprises, and we are strong in traditional sectors like automobile, pharmaceuticals and biotech.
- Today, however, European technology start-ups and SMEs struggle to reach global scale because of a fragmented market, in competition with integrated markets such as North America.

What the Digital Single Market is

- A fully functioning Digital Single Market means an area where:
 - consumers can easily shop on-line without borders, have access to digital services (whether public or private) irrespective of where they originate from in the EU, carry their legally acquired content, enjoy connected objects or apps and feel they can have the same trust in websites or online services from their own MS as from another MS knowing that their private data is highly protected;
 - businesses do not find it more burdensome to set up, market and provide their goods and services across borders than within their Member State and are able to compete on a level playing field in the online environment on the basis of a clear legal framework.

We do not yet have a Digital Single Market

- Only 14% of SMEs use the Internet to sell online. Only 12% of consumers shop across borders. Less than half of Romanian citizens use the Internet while it's 93% in Denmark. The market is fragmented. Consumers are frustrated when they are unable to access digital services in another Member State because of restrictive business practices or legal impediments or because of the complexity and lack of transparency of applicable rules.

- Legal insecurity, compliance costs or having to pay 5 times more for shipping cross-border than for domestic deliveries stops businesses from growing cross-border and modernising. Some businesses cannot go online at all due to the lack of world class networks across the EU or fail to gain visibility on dominant vertically integrated platforms. A fully functioning digital single market is also necessary for the success of our research based digital industrial strategy (e.g. data, robotics, 'Airbus for chips').

Economic, social and environmental impacts

- A recent study conducted by the European Parliamentary Research Service estimates that a fully functioning DSM could contribute as much as 2.6 % of EU GDP growth per year in the long run, or €340 billion.
- Economic aspects of Digital Single Market (in particular the "cost of non-Europe" in this area) are being further analysed in a Commission study.

Digital Single Market Strategy presentation

- Digital technology is the foundation of all modern innovative economic activities. In only a few decades, the world economy has been radically transformed by computers, the Internet, smartphones and the sharing economy.
- Innovation can bring economic growth, but can also disrupt sectors and reveal regulatory gaps. Adopting national solutions to address these gaps leads to barriers that do not exist in the physical world, such as geoblocking or data location requirements.

- Our aim is simple. Adopt a European Strategy, creating a Digital Single Market defined as an area where the free movement of goods, persons, services and capital is ensured and where citizens and businesses can seamlessly access and exercise online activities under conditions of fair competition, irrespective of their nationality or place of residence.
- The Digital Single Market will be built on three pillars:

I. Better online access for consumers and businesses across Europe

- Preventing unjustified geoblocking: simply put, discrimination on the basis of nationality, residence or geographical location should not exist. We don't accept it in the physical world, we should not accept it in the digital world either and we will put forward legislation that confirms this.
- E-commerce rules that consumers and business can trust: consumers and smaller companies are reluctant to engage in cross-border e-commerce because they don't know the rules that apply to these transactions and to possible complaints. Legislation is needed to address the current fragmented consumer law. We need to harmonize EU rules for online purchase of digital content. And we need to debate on the application of the trader's national law, together with a set of key mandatory EU contractual rights, for the cross-border sale of tangible goods.
- Affordable cross-border parcel delivery: two thirds of companies selling online believe that the cost of parcel delivery is too high. Consumers often find themselves in the situation where they would have to pay more for the transport of a product than for the product itself and give up on a cross-border purchase. The Commission will propose further action to industry for improving price transparency.
- A modern copyright framework: digital spending on entertainment and media should be booming. But restrictions on access to copyright protected content are very common and frustrate consumers that want access, are willing to pay, but are denied service. Europe needs a more harmonized copyright regime, allowing transmission and consumption of content across border. The Commission will make legislative proposals before the end of 2015 to reduce the differences between national copyright regimes and allow wider online access.
- Reducing VAT related burdens: the Commission is working to minimize burdens attached to cross-border e-commerce arising from different VAT regimes, especially for small and start-up companies, provide a level playing field for EU business and ensure that VAT revenues accrue to the Member State of the consumer.

II. Creating the right conditions and a level playing field for advanced digital networks and innovative services

- A strong telecoms and media market: a Digital Single Market cannot function without access to adequate connectivity based on a sustainable, market-based, high-performance fixed and wireless broadband infrastructure at affordable prices. An ambitious overhaul of the telecoms regulatory framework is foreseen for 2016.
- The audiovisual landscape also must be adapted to the new technological environment. The Commission will review the Audiovisual Media Services Directive, focusing on issues such as the roles and responsibilities of all market players, promoting European works, advertising and protection of minors.

- Role of online platforms: Platforms have innovated considerably, transforming whole sectors, strongly challenging the traditional business models in the process. But there are many concerns about platforms, such as control of data, excessive bargaining power or, in the case of the sharing economy platforms, accusations of circumventing social and safety legislation at national level. There is a strong need for better evidence base and the Commission will launch a comprehensive assessment on the role of platforms by end 2015.
- Combating illegal content on the Internet: illegal content is a significant issue in today's Internet. Removing such content is a slow and complicated process and sometimes legal content is removed erroneously. The Commission will analyze the need to propose more rigorous, harmonized procedures for removing illegal content and whether to require intermediaries to exercise greater responsibility and due diligence (*duty of care*) in the way they manage their networks and systems.
- Supporting innovators in the market: innovation is the biggest growth driver in the digital economy. All national and European initiative should promote an innovation-friendly climate, helping SMEs and start-ups succeed.
- Trust and security in the handling of personal data: cybersecurity is a borderless problem, which requires European level solutions. A major step in this respect will be the adoption of the EU rules on data protection. Another will be the review of the ePrivacy Directive.

III. Maximizing the growth potential of the Digital Economy

- Building a data economy: Data is often considered as a catalyst for economic growth, innovation and digitisation across all economic sectors, particularly for SMEs (and start-ups) and for society as a whole. However, in the EU, restrictions, such as those related to data location (i.e. Member States requirements to keep data inside their territory) force service providers to build expensive local infrastructures (data centres) in each region or country. The Commission will propose in 2016 a European 'Free and secure flow of data' initiative that tackles restrictions on the free movement of data for reasons other than the protection of personal data within the EU and unjustified restrictions on the location of data for storage or processing purposes.
- Interoperability and standardization: interoperability allows for effective communication between digital components like devices, networks or data repositories. It also means connecting better along the supply chain or between industry and services sectors. Standardisation has an essential role to play in increasing interoperability of new technologies within the Digital Single Market. The Commission will launch an integrated standardisation plan to identify and define key priorities, including technologies (IoT, 5G, and big data), interoperability, and essential sectoral standards.
- An inclusive digital economy and society: The Commission aims to support an inclusive Digital Single Market in which citizens and businesses have the necessary skills and can benefit from interlinked and multi-lingual e-services, from e-government to e-health.

Effective Digital Single Market Governance

- The strategy for a Digital Single Market is about transforming European society and ensuring that it can face the future with confidence. The Commission invites the European Parliament and Council to endorse this Strategy to complete the Digital Single Market and to actively engage in its implementation, in close cooperation with all relevant stakeholders.

Roadmap for completing the Digital Single Market

Actions ¹	Timetable
Better access for consumers and businesses to digital goods and services across Europe	
Legislative proposals for simple and effective cross-border contract rules for consumers and businesses	2015
Review the Regulation on Consumer Protection Cooperation	2016
Measures in the area of parcel delivery	2016
A wide ranging review to prepare legislative proposals to tackle unjustified Geo-blocking	2015
Competition sector inquiry into e-commerce, relating to the online trade of goods and the online provision of services	2015
Legislative proposals for a reform of the copyright regime	2015
Review of the Satellite and Cable Directive	2016
Legislative proposals to reduce the administrative burden on businesses arising from different VAT regimes	2016
Creating the right conditions for digital networks and services to flourish	
Legislative proposals to reform the current telecoms rules	2016
Review the Audiovisual Media Services Directive	2016
Comprehensive analysis of the role of platforms in the market including illegal content on the Internet	2015
Review the e-Privacy Directive	2016
Establishment of a Cybersecurity contractual Public-Private Partnership	2016
Maximising the growth potential of the Digital Economy	
Initiatives on data ownership, free flow of data (e.g. between cloud providers) and on a European Cloud	2016
Adoption of a Priority ICT Standards Plan and extending the European Interoperability Framework for public services	2015
New e-Government Action Plan including an initiative on the 'Once-Only' principle and an initiative on mandatory interconnection of business registers	2016

Cloud computing

- According to a 2015 IDC study contracted by the Commission cloud computing has the potential to add €450bn to EU GDP between 2015 and 2020, as well as to create 1.6 million additional jobs and 300.000 companies from 2008 to 2020.

¹ To the extent that the listed measures are likely to have significant impacts they will be accompanied by a separate impact assessment in line with the Commission's Better Regulation principles

- According to Eurostat data from December 2014 only 19% of companies across the EU use paid cloud services and only 21 % of the EU population aged 16-74 used cloud-based storage services to save documents.
- The European Parliamentary Research Service estimated the cost of an incomplete Digital Single Market for cloud computing at between €31.5 and €63 billion per year in its September 2014 report on "The Cost of Non-Europe in the Single Market".
- The September 2012 European Cloud Computing Strategy included a key action to establish a European Cloud Partnership with the aim to close the gap between the public and the private sector.
- The European Cloud Partnership's high-level steering board, with public and private sector CEOs and CIOs as members, [REDACTED], published its Trusted Cloud Europe report in March 2014, with recommendations to the Commission, Member States and industry to support the development of cloud computing in Europe. The formal mandate of the European Cloud Partnership's ended with the publication of the Trusted Cloud Europe report.
- As part of the DSM European free flow of data initiative the Commission will undertake an assessment of Member States' requirements that restrict the free flow of data within the Union. If necessary the Commission will then consider legal measures that address those requirements, complementing the current and future data protection framework. The Commission will also consider appropriate policy measures that support the free flow of data within the Union, including issues of usability and access to data, as well as the interoperability of systems that may otherwise inhibit access or portability.
- As part of DSM European cloud initiative will facilitate clear and credible certification of services that are compliant with these European requirements, particularly on security and data protection, in order to allow users to benefit from secure, reliable and high-quality cloud services. It will ensure that SMEs and consumers are able to switch to a different service provider without undue technical or administrative restraints, and other contractual issues that require a common approach in a single market. The initiative will also link to other actions under the DSM strategy, including on contract terms and conditions and on standards.

FIWARE

What is FIWARE?

- FIWARE is an open platform technology which consists of a set of 42 high-level, multifunctional software components available to anybody today on www.fiware.org. All components, called enablers, come with open specifications and an open source reference implementation free to use. They are sector independent and generic building blocks for any innovative Internet platform, application or service. They can be freely recombined with other technologies, e.g. Android or IBM's proprietary Intelligent Operations Centre.
- The rich and still expanding FIWARE ecosystem includes important industry leaders such as ATOS or Telefonica, more than 1000 startups & SMEs, some 800+ coaches &

mentors, a network of 50+ cities and a rapidly growing community of 2500 developers.

- FIWARE is open to any developer community building innovative end-user services and applications without the risk of vendor lock-in that proprietary platforms have. It allows its innovation principles, such as coherence, openness and fairness and advancing technology and society, to be shared and reviewed in public, subsequently leading to a new democracy at service platform level.

Atos' role in FIWARE

- ATOS is the lead member of the core group of companies pushing for a broader industrial use of FIWARE. This conversation is led at highest level in ATOS, by [REDACTED].
- To date other industries in this core group are: Telefonica, Engineering and Orange. Board-level executives of these companies discuss regularly among themselves the industrial vision they have for FIWARE and the plans for implementation. Telefonica and ATOS are in conversations with Siemens, Bosch and Deutsche Telekom to convince them to join.
- Mario Campolargo visited [REDACTED] in December 2014 to discuss options for FIWARE use in ATOS and in industry in general (BTO). Since then we are in close contact with [REDACTED] to support the industry conversations for a broader FIWARE use.
- Atos promised to put FIWARE in production within their company if they can have a stress test along their specifications (pretty much a requirement for all software companies like ATOS or Engineering have in order to be sure to use production ready software when building/selling services to their customers).
- FIWARE is used commercially today by Telefonica, ATOS and Engineering. However so far limited to a few contracts. Latest news is that the City of Santander signed a contract with Telefonica for a city-wide online service platform based on FIWARE (see announcement)
- Since the sale of Siemens IT to ATOS back in 2011, Siemens is the largest customer to ATOS and at the same time the latest shareholder. For ATOS this is an important and privileged relationship, [REDACTED] meets regularly [REDACTED] Siemens [REDACTED]
- Regarding the MoU entitled "Towards Open Urban Platforms for Smart Cities and Communities" you endorsed at the Smart City EIP General Assembly in Berlin on 21 May 2015: There has been a high-level meeting between FIWARE and this Smart City MoU [REDACTED] on 23 June 2015 to see whether the FIWARE network of cities (more than 90 cities) and the MoU have the same objectives and possibly could merge for higher common impact.

High Performance Computing

- Atos is a global digital services leader with 2014 pro forma annual revenue of circa € 10 billion and 86,000 employees in 66 countries. The main stakeholder is SIEMENS. Atos and SIEMENS have established a Global Alliance to provide efficiencies in data centres while offering integrated end-to-end solutions for enterprises' facing increasing requirements on data center operations and building efficiency, across many markets worldwide
- Atos has a global client base, providing Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry
- Atos is an active stakeholder in the different initiatives regarding the DSM: Internet of Things, Cloud Strategy, and in the two contractual Public-Private Partnerships (PPP) in HPC and Big Data:
- The PPP on High Performance Computing (HPC) (operational in 2014) to support the implementation of the HPC strategy (outlined in the Communication "High Performance Computing: Europe's place in a Global Race") to ensure European leadership in the supply and use of HPC systems and services by 2020 (€700 million earmarked in Horizon 2020)
- The Big Data Value PPP (operational in 2015) to strengthening the data value chain, in order to allow Europe to play a relevant role on Big Data in the global market (€500 million earmarked in Horizon 2020)
- Worldwide the proportion of sites exploiting cloud computing to address parts of their HPC workloads rose from 13.8% in 2011 to 23.5% in 2013, with public and private cloud use about equally represented among the 2013 sites.
- An important new area for the European HPC ecosystem is high performance data analysis (HPDA)—using HPC for data-intensive simulation and advanced analytics. HPDA requirements are increasing in many scientific domains and are driving more commercial companies, including SMEs, to exploit HPC technology for the first time. 67% of the HPC sites use HPC systems for HPDA; HPDA use consumes 30% of their HPC cycles on average; 23.5% of the HPC sites were using cloud computing to address parts of their HPC workloads rose, with public and private cloud use about equally represented among the sites.
- On the Juncker Investment plan, HPC is one of the proposed areas. The expected result is to position Europe as a world-class HPC hub by renewing the current set of European HPC top systems and providing access to world-class HPC services for European academia and industry. This investment on HPC infrastructures is complementary to the efforts of the PPP in HPC that concentrate on HPC technology development and HPC use
- The European high-performance data networks "Game Changer" of the EU Investment Plan/Digital has three components builds on the existing EU-led programmes on high-speed research connectivity, high-performance computing infrastructures and data infrastructures. The concept target is the deployment of an interconnected data processing network composed of

- (1) deployment and connecting high-performance computing facilities
- (2) high-speed trans-European network
- (3) connected large and small data centres
- Europe is leader in HPC-powered applications that address societal challenges or are important for industrial competitiveness. A huge demand for HPC is also present in emerging domains such as health, demographic change and wellbeing; secure, clean and efficient energy; smart, green and integrated transport; climate study, monitor and action; food security, sustainable agriculture, marine research and the bio-economy; Global System Science, in the Human Brain Project, in food security, in etc.

Cybersecurity

Policy initiatives and R&I action in the area of cybersecurity and privacy

- The Network and Information Security (NIS) Platform – in which ATOS participates through its Research Department [REDACTED] – has already issued some guidance and further work will be undertaken in 2014-2015.
- Cybersecurity and privacy remain a focus in R&I and past and ongoing projects help reducing the risk of data breaches and of databases being exploited covertly for unlawful purposes;
- In FP7 more than 200 Million Euro have been dedicated to research in Trustworthy ICT. Horizon 2020 will expand that support for research and innovation for digital security, privacy and data protection under both its pillars LEIT and Societal Challenge 7 (Secure Societies).
- In 2014, privacy and data protection are directly addressed in a SC7 call on privacy, access control and risk management, while LEIT financed this year calls in the area of cryptography and security-by-design.
- For the next years, privacy and security will play a fundamental role in R&I calls not only in their specific focus areas, but in the horizontal research areas of big data, and internet of things as well as in application areas of eHealth, Smart Cities, Energy and others.
- This effort in R&I is expected to significantly increase the existing levels of cybersecurity and privacy, but also specifically in the area of data security.

Cybersecurity Industrial Strategy Advisory Group

- The Cybersecurity Industrial Strategy Advisory Group (CISAG) was convened for a very first time on 25th March 2015 and will reflect on the diminished trust in Information and Communication Technologies, seriously undermined by reports of omnipresent surveillance and the multitude of cyber incidents.
- The CISAG will be expected to propose innovative ideas and solutions to better protect our society and economy against disruptions of digital technologies while safeguarding fundamental rights as well as to provide incentives for the industry to supply more secure solutions and stimulate their take-up by enterprises and citizens.

- The CISAG report is expected by the beginning of July.

DSM Action on the "Establishment of a Cybersecurity contractual Public-Private Partnership" - Cybersecurity Industrial Strategy

a. Context

- The mandate of Commissioner Oettinger clearly includes: "Developing and implementing measures to make Europe more trusted and secure online, so that citizens and business can fully reap the benefits of the digital economy. I would like you to work with the Vice-President for the Digital Single Market on a plan to make the EU a leader in cyber security preparedness and trustworthy ICT, and to increase the confidentiality of communications".
- In 2013 the European Cybersecurity Strategy was adopted. It contains an integrated approach with five strategic priorities. One of these priorities is to develop industrial and technological resources for cybersecurity. Rising costs and increasing frequency and severity of cyber incidents have increased the urgency to act. Therefore it is proposed to develop an Industrial Strategy for Cybersecurity stimulating the take-up and the supply of secure ICT solutions in Europe. Overall objectives would be to increase trust of citizens / consumers, enterprises and governments, foster the EU digital economy, boost Europe's competitiveness in a high-added value industrial sector, and position Europe as the (most) trustworthy in the digital space.

b. Cybersecurity Industrial Challenge

- The fragmentation of supply for ICT security in Europe is blatant: it is nowhere near some more structured industries, such as microelectronics, where well-established regional cluster of excellence and ecosystems can be identified, leveraging academia, industrial, institutional and customers/users capacities. However, recent initiatives in France and Germany are showing that the aggregation of competencies and industrial forces in this area start regrouping / structuring at national level. There is obviously a need to stimulate and coordinate this promising development at European level, to maximize synergies, facilitate networking between these clusters, ensure cross-fertilisation and foster replication beyond the large Member States. This coordination could also be facilitated by a good mechanism of governance of the initiative, involving actors from industry, Member States, agencies, user communities and civil society.
- The industry is facing challenges with respect to digital security, not least economic constraints, the lack of harmonisation of legal frameworks, the need for small businesses to benefit from best practices. The NIS Platform is also looking into future research priorities, identifying the key challenges and corresponding desired outcomes in terms of innovation-focused, applied but also basic research in cybersecurity, privacy and trust, and propose new ways to promote truly multidisciplinary research that foster collaboration among researchers, industry and policy makers. This should result in the publication of a Cybersecurity Strategic Research Agenda (SRA) of the NIS Platform in the first quarter of 2015.

c. Launching a Public-Private Partnership on Cybersecurity in 2015

- The establishment of a contractual Public-Private Partnership addressing digital security would enable to address an important and urgent need to close a gap in our industrial strategy, in an area that is of strategic importance to protect digital assets in Europe. Cybersecurity is a dynamic, multi-faceted challenge to the economy, policy, and society at large. Current EU policies aim at data protection and the security of

network and information systems, including critical infrastructures. Much work has been done already in cybersecurity (and related work such as the cloud strategy), including industrially relevant work (H2020, NIS Platform).

- A coherent industrial approach bringing public and private resources together would now provide significant added value. It should stimulate the supply of secure ICT solutions in Europe and their adequate implementation (technology and associated processes and practices) to improve the overall security of our ICT systems, thereby limiting the risk and the impact of cybersecurity incidents, while increasing consumers' and citizens' trust and fostering the EU digital economy; a key objective would be to foster continuous innovation, which is indispensable to effective security.
- A Contractual PPP gathering industrial and public resources would deliver innovation against a jointly-agreed strategic research and innovation roadmap (e.g. the SRA delivered by the NIS platform) and maximize available funds through better coordination with MS and better focus on a few technical priorities (such as cryptography). It should leverage funding from Horizon 2020 LEIT-ICT and Societal Challenge 7 Secure Societies to deliver societal benefits for users of technologies (citizens, SMEs...) and provide visibility to European R&I excellence in cyber.

Internet of Things

- Within the DSM strategy, IoT is clearly earmarked as a priority technology. It is in particular needed to work on standards and interoperability, to avoid a fragmented situation to emerge. The whole ambition of the DSM strategy in the IoT context is to:
 - help Europe get access to IoT platforms controlled by EU players, to avoid replication of the Mobile platforms developed in the US only;
 - help Europe to digitize downstream sectors;
 - provide a European level playing field to catalyze IoT deployments;
 - help Europe to secure a strong supply industry in the IoT sector
 - Solve related societal issues, such as user acceptability, trust, confidence, liability.
 - Solve remaining technical issues (end to end security, cross silo operations).

AIOTI – The Alliance of Internet Innovation

- AIOTI supports the policy and dialogue within the Internet of Things (IoT) ecosystem and with the European Commission. It builds on the work of the IoT Research Cluster (IERC) and expands activities towards innovation within and across industries. This also offers an opportunity to discuss legal obstacles to further IoT take up, and to forge consensus. The Alliance will also help the Commission prepare future IoT research and innovation, standardisation and policy.
- The Alliance will also be instrumental in the definition and design of IoT Large Scale Pilots to be funded under the Horizon2020 Research and Innovation Programme. These pilots could include solutions in markets like smart living environment, farming, wearables, smart cities and mobility. The Alliance should help build the links and forge the cross-sectorial synergies required for this.

- AIOTI brings together:
 - Different industries: nanoelectronics/semiconductor companies, Telecom companies, Network operators, Platform Providers (IoT/Cloud), Security, Service providers
 - Different sectors: energy, utilities, automotive, mobility, lighting, buildings, manufacturing, well-being, supply chains, cities etc.
 - And some of Europe's largest tech and digital companies: Alcatel, Bosch, Cisco, Hildebrand, IBM, Intel, Landis+Gyr, Nokia, NXP Semiconductors, ON Semiconductor, Orange, OSRAM, Philips, Samsung, SIGFOX, Schneider Electric, Siemens, STMicroelectronics, Telecom Italia, Telefonica, Telit, Vodafone, Volvo

Outline of impact of IoT

- The Internet of Things (IoT) represents the next major economic and societal disruption enabled by the Internet. With billions of people connected to the internet today, and the number of connected devices to exceed 50 billion by the year 2020, the Internet of Things (IoT) represents a major transformation in a digital world that has the potential to affect everyone and every business.
- IoT can be defined as physical objects that connect to the internet through embedded systems and sensors, interacting with it to generate meaningful results and convenience to the end-user community. The IoT will help to enable an environment with the flexibility to provide services of all sorts, ranging from home automation to smart retail/logistics, and from smart environmental monitoring to smart city services. In a very short time, the IoT will have sensing, analytics and visualization tools, which can be accessed by anyone, anytime and anywhere in the world on a personal, community or a national level.
- With the IoT, any physical and virtual object can become connected to other objects and to the Internet, creating a fabric between things as well as between humans and things. The IoT offers to merge the physical and the virtual worlds into a new smart environment, which senses, analyses and adapts, and which makes our life easier, safer, more efficient and more user-friendly.

Industry 4.0 / Digital Industrial Strategy

- Digital technologies increasingly play the central role in value creation in the entire economy and bring about radical transformation to all aspects of production and related services. This is why the EU's target of 20% share of industry in GDP can only be achieved if digitisation of products, processes and business models is mainstreamed across all industrial sectors in Europe.
- Industry in Europe has assets to build e.g. leadership in industrial robotics and factory automation, in enterprise software or in 3D- and laser-based manufacturing. On the other hand, there are also major weaknesses including in internet and web technologies and consumer products and digital services. However, areas like big data, the internet of things and autonomous systems offer great opportunities. In order to seize them, there is urgency for acting fast, at the right scale and jointly at the European level.

- The Commission is therefore proposing a European strategy for the digital transformation of industry, which complements the upgrading of our digital infrastructure and complements the Digital Single Market Strategy as presented on 6 May. Four lines of action are suggested to maximise the benefits from digital technologies in every industrial sector in Europe.

Summary of the four action lines

1. We need to facilitate access to digital technologies for any industry in Europe: our ambition should be to empower any business, wherever it is located in Europe, and especially SMEs and mid-caps, to master its digital transition.
2. Our actions should aim at leadership in digital platforms for all of our industry: the objective is to ensure the availability of state of the art open and interoperable platforms that any business can use to make its products, processes or services ready for the digital age.
3. We must fill the skills gap and prepare our workforce for change: there is a clear need for promoting digital skills and related way of thinking in education at all levels, for re-skilling, and for lifelong learning across Europe and its regions.
4. We need to ensure that existing and new regulation is fit for purpose in the digital world.

Detailed outline of the 4 concrete actions

1 A digital innovation hub in every region of Europe

What:

Empower any business, wherever it is situated in Europe, especially SMEs, to lead its digital transition, by ensuring that it understands the digital opportunities, has easy access to advanced digital technologies, finance and support services.

Why:

Manufacturing represents 15 % of GDP in the EU. It is the principal source of exports (80% of total EU exports), the major source of investment in research and development (almost two thirds of R&D), and is a main driver for employment in other sectors, including the services sector. Digital technologies increasingly play the central role in value creation in all industrial sectors and bring about radical transformation to all aspects of manufacturing and related services.

The use of digital technologies in industry varies across sectors and Member States, particularly between high-tech areas such as aerospace and more traditional areas such as construction. There are also large disparities between large companies with the capacity to invest in innovations and SMEs that struggle to keep pace with fast technological developments.

A mere 14% of SMEs use the internet as a sales channel today. The use of advanced digital technologies² is even lower, with a tiny 1.7% of EU enterprises making full use, while 41% are not using any of them. Yet the role of SMEs and mid-caps is essential as they constitute a large part of the industrial fabric in many Member States and are key links in EU-wide value chains.

² mobile solutions, social media, cloud computing and big data

How:

- Reinforce the technology and knowledge capacities of existing digital excellence and competences across Europe with the aim of opening them up to businesses, notably SMEs, and support them in their digital transformation (smart products, services and manufacturing processes) and new digital business creation.
- Support new capacity building in regions which are currently not at par, taking into account their economic strengths (smart specialisation).
- Set up pan-European networks of centres of digital competences, to create synergies and pool resources across the EU and offer a 'one-stop-shop' for the digital needs of industry. This includes the use of the cascading funds mechanism of Horizon 2020 to support 200 cross-border and cross-value chain experiments per year.
- Complement these networks of competence centres and innovation hubs by demonstration facilities and fab-lab³ like installations and support to pilot lines for production when necessary, for which investment should be matched by industry.

Resources to be mobilised to support the organic growth of digital ecosystems:

Encourage all regions and member states to promote digital manufacturing initiatives like Industrie 4.0 (DE), Smart Factories (NL), Usine du Futur (FR) or High Value Manufacturing Catapult (UK) and provide appropriate investments.

Mobilise significant investments at the European level:

Substantially strengthen successful European initiatives such as I4MS (ICT for Manufacturing SMEs) or the "Smart anything everywhere" initiatives through additional investments from the Structural Funds (ESIF) and the optimal use of the European Fund for Strategic Investments. Planned investments in such initiatives in Horizon 2020 are around 500M€ over 5 years while investments in ESIF and EFSI could be 10 times higher.

We can only realise this ambition if regions, member states and the EU join forces. Regions and Member States have a key role to play in catalysing this, with centres leading the way. N.B. digital innovation and SMEs are core priorities of regional programming for ESIF.

2 Leadership in digital platforms for industry:

What:

Industry in Europe must lead and be a major contributor to the next wave of digital platforms that will replace today's Web search engines, operating systems and social networks.

Why:

A few players, mainly non-EU companies, dominate digital platforms today. These are, to a large extent, non-EU digital online platform providers such as Internet companies that do not only develop their business on the basis of new data value chains and connectivity but are also

³ Fab-labs are complete experimental factories that industry can use to test new production processes and logistics mechanisms. Currently around 15 such installations exist in Germany

seeking to expand beyond their traditional markets. Such changes can lead to critical disruption in business models that affect large sectors such as automotive and transport and more generally all manufacturing and service sectors.

Competition for leadership in core digital platforms for industry has already started and can lead to market dominances similar to what happens for the web today. This is also important to ensure interoperability and standards which are essential for the next generation of smart products that operate in interconnected environments such as cars or homes.

How:

In addition to a regulatory environment conducive to business developments of platforms in Europe we need to foster research and innovation ecosystems for European platforms to emerge: in order to ensure the availability of state of the art open digital platforms that any business can use to innovate its products, processes or services, collaboration is needed between actors across value chains, including users and suppliers.

The intention is to focus the efforts of Public Private Partnerships (PPP) for Research and Innovation on the future generation of integrated digital platforms. These are rooted in the ECSEL Joint Technology Initiative (JTI) and within the ICT part of the Factories of the Future PPP, the big data PPP and the Focus Area of Internet of Things in Horizon 2020. This will include large scale demonstrators involving all actors across the value chain including SMEs suppliers and users of the technology. Projects would go from R&D to piloting and testing down to standardisation.

The aim should be to broaden and expand successful projects financed under the JTI like CESAR that has led to the open AUTOSAR standard for the automotive industry. Industry in Europe has assets to build on: this includes leadership in industrial robotics and factory automation (30% of world market share), in embedded digital systems, enterprise and product design software (33% of world market share) and in 3D- and laser-based manufacturing (25/40% of world market share).

Promising platforms for the deployment of Internet services and funded by EU programmes include the FIWARE platform from the Future Internet PPP which targets for example service development in cities. It also includes demonstration actions in COSME, such as the smart use of ICT and integration of SMEs in digital value chains.

Resources to be mobilised:

Upscale the development of European platforms from 2015 on with the launch of at least 5 large-scale platform projects per year (2015-18) under ECSEL, FoF, IoT and Big Data.

Investments in platform-building in ICT in H2020 is expected to reach more than € 150 million per year in the next three years, complemented by contributions from Member States and a substantial matching investment by industry, leading to a total of more than € 3 billion over the next five years.

We can leverage these investments with additional support from ESIF and the European Fund for Strategic Investments (EFSI) with a maximum tenfold multiplying effect for the deployment and testing of platforms in smart cities, smart homes, or for other big data applications such as health, entertainment or education.

3 Filling the skills gap, reskilling the workforce preparing it for the 21st century:

What:

Ensure adequate supply of digital skills, including reskilling of the work force.

Why:

The digital skills gap in Europe is widening and is expected to reach more than 500,000 unfilled digital professional vacancies in 2015.

While jobs will continue to be lost with the replacement of repetitive and non-creative tasks, the need for new, highly specialised skills is exploding, such as for big data analytics, cyber-security and automation.

How:

The Commission can act as a catalyst for “digital skills and way of thinking” in education (from school, vocational training, to executive management training), re-skilling, and life-long learning across Europe and its regions to ensure adequate skills for using digital technologies in the product lifecycle.

The forthcoming Knowledge Innovation Community on manufacturing will have an important role in developing adequate skills in this area.

This includes exchange of best practices and agreement on a charter of actions at Member States level, targeting more specifically the skills needed in industry.

4 Smart legislation for smart industry

What:

Fit-for-purpose legal frameworks tackling aspects like a possible regulatory framework for platforms, liability, safety, IPR and data protection.

Why:

The development of robotics, smart objects and the 'Internet of Things' as well as big data analytics creates important regulatory challenges that need to be addressed. Of particular importance are:

- liability issues with new systems such as autonomous driving that need to be tackled to unlock business development in these fields;
- safety issues in robotics e.g. the confinement of robots in cages rather than exploiting smart collaboration with humans;
- Availability and use of 'big data': this is crucial for maintaining the EU's competitiveness. Currently there is a lack of clarity about who owns industrial data, how it may and may not be used, by whom, and who is liable in case of issues. This reduces incentives to develop data-analytics services. It also puts industrial IPR and know-how at risk. More

can and should be done to bring big data to innovators that could already exploit it with new applications.

How:

We need to mobilise all our policy instruments to make sure that digitisation of our industry is effective, quick and smooth. That includes adaptation of our regulatory environment within a digital single market ensuring trust and security in digital business and addressing key issues such as data protection and ownership as well as new liability and safety challenges.

In order to make quick progress, we will invite key players to share their views on how to transform our current legislation on the possible regulatory framework for platforms, liability, safety, IPR and data protection to make it fit for purpose in the digital world.

On this basis, we could use the Regulatory Fitness Programme of the EU (REFIT) to revise current legislative frameworks.

ICT 2015 Conference in Lisbon

The European Commission, together with the [Fundação para a Ciência e a Tecnologia](#) organises this year the **ICT 2015 - Innovate, Connect, Transform** conference, on **20-22 October 2015 in Lisbon, Portugal**.

The ICT conference is **a major event in the European ICT calendar**. It is a stakeholder event that has been organised on a regular basis since 1998.

ICT2015 is a policy conference in which will be presented the new Commission policies and initiatives with regard to Research & Innovation in ICT- in particular contributions to two of the top 10 priorities of the Juncker Commission: **The Connected Digital Single Market and Jobs, Growth, Investment and Competitiveness**. **Industrial leadership** is a prominent topic on the conference agenda.

The conference, alongside an exhibition, networking sessions and parallel events is designed to engage stakeholders from the ICT research and innovation communities to inform about the content of the ICT parts of the H2020 Work Programmes and Research & Innovation priorities for 2016-17.

The expected number of participants this year is around 4500 delegates.