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IoT Driving Digital Transformation – Impact on Economy and Society

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1.1 IoT as a Major Enabler for Digitizing Industry

In recent years, the Internet of Things (IoT) has been gathering pace and unleashing a very disruptive potential. According to Gartner, nearly five billion “things” were connected in 2015 and the number will reach 50 billion by 2020. However, the IoT does not only have a disruptive power but it is also one of the main drivers and enablers for the Digitising European Industry strategy announced by the European Commission in April 2016.

IoT is as multidimensional and multi-faceted as the many ‘things’ that form it, therefore the main issues and challenges have to be addressed comprehensively and from many angles. At the European Commission, we are addressing IoT as a strategic dimension of the Digital Single Market (DSM), not only in terms of regulatory challenges but also with regard to interoperability issues and the possible fragmentation of standards, probably the most important obstacles at the moment. The IoT is therefore at the core of digitisation processes of the economy and society and an essential building block for the DSM.

A fully-functioning Digital Single Market is a pre-condition for Europe’s prosperity and competitiveness in a globalised world economy. The DSM aims to remove boundaries and obstacles in the digital world and to boost our internal market of nearly 510 million customers and over 20 million companies for digital products.

1.2 Main Elements of the IoT Implementation Plan and Its First Pillar

The European Commission, being fully aware of the importance of IoT and its growing impact on EU citizens' lives and on the European economy, has been consistently aiming to achieve Leadership in Internet of Things for Europe, as envisaged in the Communication on 'Digitising the European Industry (DEI) – Reaping the full benefits of a Digital Single Market'.

All our actions aim at achieving 3 objectives, outlined in the Staff Working Document 'Advancing the Internet of Things in Europe': (i) a single market for IoT – which means seamlessly connected devices and services; (ii) a thriving IoT ecosystem – including open platforms and standards used across sectors; and – (iii) last but not least – a human-centred IoT – encompassing European values, personal data and security. These 3 objectives are at the same time the basis for the main pillars of our IoT implementation strategy.

Under the first pillar, our efforts aim to provide appropriate regulatory framework conditions to facilitate the creation of an IoT single market. In this context, the Commission is focusing on 5 specific actions. Given the huge importance of data ownership, privacy and security to EU citizens, we are clarifying the legal framework in relation to data, its free flow and ownership. This means that we are trying to answer the question – Who has the economic right to data? We are also dealing with rights to access, transfer and usage of non-personal data.

Additionally, the Commission is evaluating the current product liability framework for its appropriateness regarding the data-based IoT products and services, and autonomous systems. Our aim is to increase investment security for companies and to reassure consumers about their right to receive compensation in case of damages caused by using these emerging technologies. The need for adapting the current liability framework is currently under review following an open public consultation and an assessment of existing law.

On top of that, we are promoting an interoperable IoT numbering space for universal object identification that transcends geographical limits, as well as an open system for object identification and authentication. In September 2016, in the proposal for the recast of the European Electronic Communications Code, we have also proposed the harmonisation and clarification of rules and governance of numbering in the M2M context, as a response to the increasing demand for such numbering resources, in particular for IoT.

Furthermore, given the fact that 5G technology is an enabler of IoT, but not yet deployed, we aim at ensuring the availability of sufficient spectrum for alternative IoT communications.

Having recognised the need to increase the trust in IoT, we are revising our 2013 Cybersecurity strategy to take into account the IoT and we are exploring the possibility of a European ICT security certification framework including the IoT aspect. In autumn this year we will come back with the means to address certification but also potential labelling as integrated measure in an ICT security certification framework. A possible “Trusted IoT label” would provide the users with more transparency and inform them properly about the different levels of trust, privacy and security an IoT solution is offering. It would therefore allow them to make more credible and reliable choices.

1.3 The Second and the Third Pillar – Projects, Partnerships and Standardisation

The actions that are being undertaken under the second pillar of the IoT implementation plan focus on creating a thriving IoT ecosystem by supporting the IoT Large Scale Pilots (LSPs) and the Alliance for Internet of Things Innovation (AIOTI). LSPs are big projects that aim at fostering the deployment of IoT solutions in Europe through integration of advanced IoT technologies across the value chain. The LSPs will define an open architecture, platforms, interoperability and will be quite active in standardisation activities. We have launched 5 LSPs at the beginning of 2017 with H2020 financial support of €100 million in 5 areas: Smart living environments for ageing well; Smart Farming and Food Security; Wearables for smart ecosystems; Reference zones in EU cities; and Autonomous vehicles in a connected environment. We plan also to look into other sectors for the use of IoT, e.g. energy. This level of funding for a pilot implementation is of a large enough scale to achieve a critical mass.

Through the current ongoing LSPs, we are supporting elderly people by giving them access to healthcare from home. We are increasing agricultural productivity and food safety, and we are also decreasing energy consumption and pollution in cities. We are increasing security in public places, mobility and traffic efficiency through the connected cars. The CORDIS website [1] provides more information about the projects and the benefits they are bringing to the European citizens.

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Moreover, in order to support the IoT deployment in Europe, we also launched in January 2016 nine projects supported by €53 million of EU H2020 funding. The aim of this European Platform Initiative (EPI) is to create ecosystems of “Platforms and Tools for Connected Smart Objects” and to overcome the fragmentation of vertically-oriented closed systems, architectures and application areas. Up to €10 million is envisaged for SMEs and start-ups working with these platforms.

One of the most prominent IoT stakeholder groups, which support technical and policy measures, is the Alliance for Internet of Things Innovation (AIOTI) that was launched by Commissioner Oettinger in March 2015 to assist the creation of a dynamic European IoT ecosystem.

The overall goal of the Alliance is the creation of a dense European IoT ecosystem to unleash the potential of the IoT. AIOTI is being consulted by the Commission on the hot topics in IoT. These include regulatory policy issues in order to help building consensus at a European level and to provide recommendations based on a broad stakeholder community. The Alliance has acquired a distinct legal personality by becoming an independent association under Belgian law in September 2016 and has almost 180 members from an industrial background, covering important areas, such as: aging well, smart farming, smart industries, smart cities, transportation and traffic, and wearables.

Of high importance is also the third pillar of our IoT implementation strategy – that is mainly focused on standardisation and interoperability.

The European Commission is fostering an interoperable environment for the IoT by closely cooperating with European and International Standards Organisations. We are continuously monitoring and reviewing the progress in promoting IoT standardisation and interoperability that would create a true IoT Digital Single Market. Additionally, we are promoting the uptake of IoT standards in public procurement.

Thanks to the tremendous work of the AIOTI, Europe has delivered on important milestones which were presented earlier this year in a joint workshop with the Commission. We gained an authoritative landscape of standardisation organisations and industrial alliances, covering all sectors and all technologies, which is being used and copied worldwide in developing standardisation strategies. Moreover, AIOTI has established itself at the nexus of global standardisation coordination and is establishing operational links with world leaders on IoT standardisation (IEEE, W3C, OneM2M, ISO/IEC, ITU, IETF, just to name a few).

The two major deliverables in this respect are the high level reference architecture, which is being used to develop interoperable IoT solutions and the joint White Paper produced by AIOTI, W3C, IEEE and oneM2M on Semantic Interoperability for the Web of Things published in December 2016.

Moreover, we are supporting international collaboration on IoT with strategic partner countries such as: Japan, South Korea, China, Brazil and USA. The cooperation takes place through policy dialogues and/or joint calls under the Horizon 2020.

Also, AIOTI has signed international agreements for industrial collaboration with similar entities in Japan and Brazil. At the Mobile World Congress 2017 in Barcelona AIOTI signed a Memorandum of Understanding with the Brazilian Camara do IoT and at CeBIT 2017 in Hannover a similar agreement with the Japanese IoT Acceleration Consortium.

1.4 Conclusion

In order to fulfil the ambitious goals outlined above, all stakeholders across the value chain have to be mobilised. We need to address new ways of value creation and enable the emergence of new cross-cutting business models. Promotion of open IoT ecosystems with special attention to SMEs and start-ups, as well as the creation of a market on IoT and a harmonised regulatory environment, especially in terms of object identification, connectivity and numbering, are of utmost importance.

The key instruments that can help in the implementation of the above steps are the Work Programme 2018–2020 for ICT in Horizon 2020 and the AIOTI.

To actively shape the IoT policy, companies, associations, Members States and other IoT stakeholders should combine and channel their resources. The European Commission can play a role as coordinator and facilitator in this process, helping to break silos and aiming to support European and global cooperation on IoT.

Reference

- [1] CORDIS online at http://cordis.europa.eu/search/result_en?q=contenttype=%27project%27%20AND%20/project/relations/associations/relatedCall/call/identifier=%27H2020-IOT-2016%27

