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Subject: *Preparation of the Council ("Competitiveness") of 2-3 March 2015*
Unlocking Europe's digital potential: faster and wider innovation through
open, networked and data-intensive research
- Communication from the Commission "Towards a thriving data-driven
economy"
- *Policy debate*

BACKGROUND

Every minute, the Internet, personal electronic devices, satellites, sensors, smart objects and industrial machines generate over 1.7 million billion bytes of data, equal to 360,000 DVDs. This unprecedented growth of data (also referred to as 'Big Data') is not only a testimony to a radical development of information and communications technologies (ICT) but above all, presents an enormous commercial, societal and research potential thanks to the rapid progress in the areas of data analysis, processing and storage.

The data-intensive sectors of the economy are growing by 40% per year, 7 times quicker than the overall ICT market. Businesses that base decision-making on data analysis see a 5-6% yearly increase in productivity. The big data phenomenon has undeniable effects on business efficiency, innovation and creativity and is predicted to spur hundreds and thousands of new jobs across Europe in the coming years.

In the field of research, data-based innovation makes it possible to extract information automatically from huge corpora of scientific texts, which dramatically increases the efficiency of scientists' work, contributes to new knowledge and insights and raises the quality of scientific output. As also noted by the OECD, text and data mining (TDM) is becoming a key enabling technology for creation of scientific knowledge.

BIG DATA CHALLENGES

According to the OECD¹ there are three main categories of Big Data challenges that need to be addressed in order to realise the opportunities of data-driven growth and innovation:

- **Supply-side challenges** related to the provision of data and analytics. These include removal of barriers to the free flow of data, including investments in mobile broadband; issues of data access, ownership, and incentives for sharing data, and access to analytics and cloud computing. Data analytics and super computing power are complementary resources needed for the use of “big data” sets. Cloud computing, often described as a service model for flexible, elastic and on-demand computing services, increases the storage and analytic capacity across the economy. However, lack of standards and interoperability and the risk of vendor lock-in may impede widespread adoption of cloud computing.

¹ <http://www.oecd.org/sti/inno/data-driven-innovation-interim-synthesis.pdf>

- **Demand-side challenges** are related to the capacity of taking advantage of big data. Some of the problems include insufficient skills and competences in data management and analytics. Recent surveys confirm that lack of data management and analytic skills is an important barrier to data driven innovation in areas including science, health care and in the public sector. Moreover issues of organisational change and data entrepreneurship need to be addressed in order to create favourable conditions for data-driven innovation.
- Finally, the **societal challenges** are affecting both the demand and supply sides with potential long-term impacts on the core values of democratic market economies and the well-being of all citizens. Responses to address potential negative impacts may include improving transparency, access and empowerment of individuals, promoting responsible usage of personal data by organisations and use of technologies in the service of privacy protection.

The European Council of October 2013² focused on the digital economy, innovation and services as drivers for growth and jobs. It called in particular for action to provide the right framework conditions for a single market for Big Data, Open data and Cloud computing. In response to this call, the Commission adopted in July 2014 the Communication "Towards a thriving data driven economy"³ which sketches the features of the data-driven economy and identifies the main areas where action is needed.

More specifically, the Communication addresses framework conditions of both regulatory and non-regulatory nature, as the backbone of viable and long-lasting expansion of the data economy in Europe. Regulatory aspects include updated rules in the fields of copyright, security, data ownership as well as trust and privacy. Other framework conditions consist of support towards research and innovation on data analytics, data visualisation and decision-making software tools; putting in place an enabling data infrastructure, ensuring interoperability and open access to data, including government and research data, as well as guaranteeing a solid skills base with a sufficient number of data professionals.

² EUCO 169/13

³ doc. 11603/14

UNLOCKING EUROPE'S DIGITAL POTENTIAL

Due to the ubiquitous nature of data, big data technologies can be game changers in all types of economic and research activities. The capacity to extract value from data is further enhanced by its mutual interplay with other recent technological developments, such as cloud computing, the Internet of Things (IoT) and enabled by e-Infrastructure services like GEANT and HPC computing. IoT and cloud computing together provide a digital infrastructure leading into a more connected, more intelligent and more technology-enhanced society, enabling innovation in all economic and socio-economic sectors.

There is a momentum for research and innovation to clearly stake its place in the Digital Single Market Strategy.

The new data technologies need to be interoperable and transferable across borders, so they can develop in a continent-wide market, including the market for knowledge. This process could be further supported by coherent digital standards that would help avoid market fragmentation.

The research perspective should be taken into account when discussing issues such as data protection and copyright, cyber-security, data storage and management, and networks. There is a need for data, including research data, which are findable, accessible, interoperable and re-usable, as well as improved data governance, appropriate skills and data infrastructures. Mainstreaming of digital innovation in sectorial policies also needs solutions for building trust and confidence.

Within the context, there is also a need to reconsider how the big data reality is reflected in the EU level recommendations for the management of intellectual property in universities and other public research organizations.

Last but not least, the emergence of a dynamic European data community is a prerequisite to the success of the digital Single Market . In that sense, a Big Data Value Public-Private Partnership was launched in October 2014. Academia, researchers, industry and policy makers will work together to contribute to the development of data technologies, backed by investments of around EUR 2.5 billion over 2016-2020.

Horizon 2020 will also support intensify research and innovation activities in the field of Data. More concretely, it features a Pilot on Open Research Data in which projects in certain areas agree to open up the data underpinning their research publications and to develop a Data Management Plan. One of the objectives of the Pilot is to assess how and to what extent research data generated by H2020 is re-used for the purpose of innovation.

QUESTIONS FOR THE DEBATE

In light of the overall context described above, the Presidency invites the Council (Competitiveness -Research part) on 3 March 2015 to address the following questions:

1. *What are the main priorities to be addressed within the forthcoming Digital Single Market Strategy in the context of open, networked and data intensive research? What are the necessary framework conditions for faster and wider data driven innovation from research perspective?*
2. *Are the “Big data” challenges accordingly addressed in national research and innovation strategies and how the coordination at the EU level could be improved?*