European Economic and Social Committee

TEN/592
European Cloud Initiative

OPINION

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Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European Cloud Initiative – Building a competitive data and knowledge economy in Europe
[COM(2016) 178 final]

Rapporteur: **Antonio LONGO**

Consultation	European Commission, 19/04/2016
Legal basis	Article 304 of the Treaty on the Functioning of the European Union
Section responsible	Transport, Energy, Infrastructure and the Information Society
Adopted in section	07/09/2016
Adopted at plenary	21/09/2016
Plenary session No	519
Outcome of vote (for/against/abstentions)	149/1/1

1. Conclusions and recommendations

1.1 The EESC supports and endorses the Commission's strategic choice of an open European computing cloud geared to the scientific community, as part of a strong political and economic commitment to digital innovation. The Committee has, on a number of occasions since 2011, put forward a series of recommendations to the Commission aimed at positioning Europe at the forefront of this promising sector, helped by leading companies.

1.2 The EESC considers that this is an absolute priority of strategic importance with regard to both bridging the technology gap and to the economic, social and cultural progress of society.

1.3 The EESC proposes a European cloud open to all citizens and businesses. First of all, the EESC calls for clarification and precision on the future timetable and arrangements for widening the user base, as promised to innovative SMEs and industry.

1.4 The EESC agrees with the Commission's analysis of the obstacles preventing Europe from tapping into the potential of data, particularly regarding the lack of interoperability, the fragmentation of structures and their lack of openness to other contributions and exchanges. The communication points to positive measures to overcome the division between national arrangements, which stand in the way of implementing a real digital single market, by means of actions to widen access and build trust between the public sector and academia, which are often totally separate and disconnected.

1.5 The EESC calls for the integration measures to be implemented in such a way as to encourage the scientific community to change its way of thinking, using mechanisms to bring together academic infrastructures, research centres and public bodies and reviewing incentive structures to secure an increase in data sharing, while those communities in which data sharing is already quite common should be encouraged to play a key role in defining the details of Open Data.

1.6 The EESC calls for greater clarity on how the European Data Infrastructure, which is also intended to promote development and the implementation of High Performance Computing (HPC), will interact with the flagship initiative to boost quantum technologies.

1.7 The EESC proposes that the Commission launch wide-ranging consultations, directly involving the scientific community and associations representing people's interests, on the decisive question of governance as well as on the progressive opening up to all and arrangements for data use and preservation.

1.8 The EESC recommends that the hardware and software needed for the European cloud be acquired in Europe, and calls for greater clarity regarding the financial resources provided by various framework programmes, the structural funds, the CEF and the EFSI.

1.9 The EESC proposes that the Commission, in agreement with the Member States, should initiate a major programme to develop and promote new, highly-qualified occupations which will open up new highly-qualified job opportunities and encourage young scientists working in other countries to return to the EU.

1.10 In order to offer businesses and the public a clear and secure legislative framework in such a strategic but also complex and fast-changing sector as the digital one, the EESC proposes that a "single digital Europe portal" be set up, so citizens and businesses have ready access to relevant EU texts.

1.11 Lastly, the EESC emphasises that if a fully-fledged digital revolution is to take place, there is a need for education and training for every age group of the European population, whether working or not. The EESC highlights the need to invest in the technological training of women and in enabling them to access senior and management posts in particular.

2. Background and content

2.1 The Commission has prepared a series of guidelines intended to lay the foundations for an open European cloud computing initiative geared to the scientific community and has published a proposal which, taking the development of "big data" as its starting point, considers that the cloud is a tool that can fully exploit the mass of data produced by public and private actors. An ability to make use of big data is seen as having an impact on the global economy, opening up the possibility of major industrial and social innovations and new financial services and products.

2.2 The Commission's proposal comes as part of a first industrial policy package under the Digital Single Market strategy announced on 19 April 2016, with a substantial EUR 50 billion financing plan, aimed at a fully-fledged "path to digitise European industry". It comprises "a set of measures to support and link up national initiatives for the digitisation of industry and related services across all sectors and to boost investment through strategic partnerships and networks".

2.3 The cloud computing initiative is one of the most important commitments to "give Europe a global lead in the data-driven economy". This choice, according to Carlos Moeda, Commissioner for research, development and innovation, is also a response "to the scientific community's plea for an infrastructure for Open Science [...] The benefits of open data for Europe's science, economy and society will be enormous".

2.4 In the Commission's view, Europe needs to answer four questions:

- how to maximise data sharing?
- how to ensure that data can be used as widely as possible, across scientific disciplines and between the public and private sectors?
- how better to interconnect existing and new data infrastructures across Europe?
- how best to coordinate the support available to European data infrastructures?

2.5 The instrument identified by the Commission is the development of a **European Open Science Cloud** – a trusted, open environment for the scientific community to store, share and re-use scientific data and results. This major instrument, designed to enhance calculating capacity, connectivity and high-capacity cloud solutions, would make use of a **European Data Infrastructure**, linking firstly the scientific community and subsequently the public sector and

industry. This requires open cooperation between all those interested in exploiting the data revolution in Europe.

2.6 The Commission makes it clear that the initiative will be complemented by further action under the Digital Single Market strategy covering cloud contracts for business users and switching cloud service providers, as well as by the free flow of data initiative.

2.7 The Commission identifies five reasons why Europe is not fully tapping into the potential of data:

- **data coming from publicly funded research is not always open;**
- **lack of interoperability;**
- **fragmentation of data and computing infrastructures;**
- lack of a **world-class High Performance Computing (HPC) infrastructure to process data;**
- the need for **advanced analytics techniques such as text and data mining in a dependable environment**.

2.8 The **European Open Science Cloud** should give Europe a global lead in scientific data infrastructures, offering 1.7 million researchers and 70 million professionals a virtual environment with services that are free at point of use. The development of this instrument would be driven by the scientific community and would also in the future be open for education and training purposes. The definition of recognised technical standards would make it possible to create a secure data environment for all users.

2.9 Starting with existing infrastructure, the Commission plans to leverage other planned actions such as open access to scientific publications and data in Horizon 2020. The **governance** of the European Open Science Cloud will be determined upon the conclusion of a thorough preparation process that is already under way.

2.10 The communication identifies the following specific measures needed in order to create the cloud:

- **make all scientific data produced by the Horizon 2020 programme open by default;**
- raise awareness and change **incentive structures**;
- develop **interoperability and data sharing**;
- create a **fit-for-purpose pan-European governance structure**;
- develop **cloud-based services for open science**;
- enlarge the scientific user base of the European Open Science Cloud.

2.11 The Commission also proposes a **European Data Infrastructure**, with integrated world-class HPC capability: this is a necessity for Europe, to be met on an exascale by 2022, and which would put it among the leaders in the field.

2.12 The Commission considers that the European Data Infrastructure will also contribute to the digitisation of industry, to fostering industrial innovation and to the development of strategic European platforms in research.

2.12.1 The actions will take place between 2016 and 2020.

2.13 In the communication, the Commission also announces a **flagship initiative** to promote the research and development of quantum technologies.

2.14 Lastly, the Commission intends to **widen access and build trust** between the public sector and academia, opening the European cloud to the public sector.

2.15 **The user base** would subsequently be extended to public services, innovative SMEs and industry. The initiative will be extended to public services on the basis of existing examples of excellence, such as the INSPIRE Directive for spatial information and the eHealth Network. It will be extended to industry on the basis of current examples of supply of key scientific infrastructures, such as Helix-Nebula, EBI-EMBL and PRACE. For SMEs, the next step could be to involve them as providers of innovative solutions for the EOSC, as is already being done under Horizon 2020.

2.16 The Commission mentions various sources of funding:

- Horizon 2020 framework programme for research and innovation;
- Connecting Europe Facility (CEF);
- European Structural and Investments Funds;
- European Fund for Strategic Investments (EFSI).

2.16.1 The initial estimate of the additional public and private investment required amounts to EUR 4.7 billion over five years.

2.17 The initiative will over time generate revenue of its own as its use by the scientific community, innovative start-ups and the public sector takes off.

3. General comments

3.1 The Commission's choice of a political and economic commitment to digital innovation, especially its choice regarding European cloud computing, meets with the EESC's full support.

3.1.1 The Commission has defined a highly ambitious strategy. Although very complex, the policy objectives are clearly defined. Europe's weaknesses and the challenges facing it in building services to exploit big data from science and public services are clearly identified and this should be the starting point for all the work to be carried out in the coming years.

3.2 Since 2011[1] the EESC has, on a number of occasions, put forward a series of recommendations to the Commission "to encourage Europe to position itself at the forefront of this promising sector, helped by leading companies".

3.3 It should however be immediately pointed out that the EESC's proposal was for a European cloud open to all citizens and businesses. The title of the communication could mislead readers because it does not indicate that it is addressed to the scientific community alone.

3.4 The EESC welcomes the Commission's decision, and highlights the strategic importance of the choices made with regard to both bridging the European technology gap and the economic, social and cultural progress of European society. The science cloud also meets the scientific community's need to have access to, and to share, public research data.

3.5 The EESC agrees with the Commission's analysis of the obstacles preventing Europe from tapping into the potential of data, particularly regarding the lack of interoperability, the fragmentation of structures and their lack of openness to other contributions and exchanges. Moreover, the EESC emphasises that there is a need for education and training for every age group of the European population, whether working or not[2]. The EESC highlights the need to invest in the technological training of women and in enabling them to access senior and management posts in particular.

3.6 The Committee agrees with the objectives and measures put forward by the communication to deal with the differing national situations, which hinder the implementation of a real European single digital market. What is more, the shift from storing personal and work-related data on private computers to using public or commercial clouds must now be seen as a general trend. The cloud initiative is therefore a step in the right direction.

3.7 The Commission's commitment to steps to widen access and jointly build trust between the public sector and academia, which are often entirely separate and cut off from each other, is also highly positive.

4. Specific comments

4.1 Certain aspects need to be clarified. The Commission's plan appears simultaneously to be highly complex in terms of its objectives but vague on a number of crucial points.

4.2 First of all, the EESC recommends that the hardware and software needed for the European cloud be acquired in Europe. Software solutions are highly developed in Europe and it should be possible to avoid technological dependence on other regions of the world. As regards hardware, the EESC is pleased to note that at least one of the two exascale supercomputers is expected to be European.

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1 OJ C 24, 28.1.2012, p.40; OJ C 76, 14.3.2013, p. 59.

2 OJ C 451, 16.12.2014, p. 25.

4.3 The EESC is also concerned about the resources, professional as well as financial, required to implement and develop the cloud. Available human resources with suitable skills will be key to unleashing big data's full potential for economic growth and jobs for Europe. We also urge the Commission to carefully take into account cross-border cloud systems in specific science communities, which already exist and work well, as well as national activities aiming to achieve the same objective.

4.3.1 While welcoming Horizon 2020 and the funding for the EDISON project which is speeding up the process of making "data scientist" a recognised profession, the EESC urges the Commission, in agreement with the Member States, to initiate a major programme to develop new, highly-qualified occupations which will promote highly-qualified jobs and encourage young scientists working in other countries to return to the EU. In particular, there is a pressing need for "data stewards" who are able to assist scientists, industry and the public administration to make the most of and share the data they collect. These Commission initiatives are of the utmost urgency and must seek to regain ground lost in terms of job opportunities.

4.4 Neither is it clear how the proposed European Data Infrastructure, which is also intended to promote development and the implementation of High Performance Computing (HPC), is to interact with the flagship initiative to complement it with a view to boosting the use of quantum technologies. The two initiatives are complementary but differentiated. While exascale supercomputers are expected to be ready by 2018, the strategy for quantum technologies is still in the early stages and has a long-term approach.

4.5 The communication is also very imprecise when it assumes that mechanisms for integration between academic structures, research centres and public institutions will naturally emerge as a result of the European Cloud for Open Science and the European Data Infrastructure. This strategy will not succeed without the alignment of all stakeholders. Raising awareness and changing incentive structures for academics, industry and public services to share data is a prerequisite for developing the European Open Science Cloud. In particular, communities where data sharing is already quite common, as in many research areas, could be key for defining the details of Open Data in a bottom-up process.

4.5.1 The EESC endorses the Commission's decision to make open research data the default option for all new projects under the Horizon 2020 programme as of 2017. The EESC urges the Commission to review the 2012 Recommendations on access to and preservation of scientific information.

4.6 Similarly, clarification is needed regarding the mechanisms intended to widen the user base, as promised for innovative SMEs and industry, via data and software centres of excellence and data service innovation hubs for SMEs.

4.7 The EESC calls for better cloud governance: according to the Commission, it will be defined following the conclusion of a thorough process of preparation which is already under way. The scientific community, businesses and the general public are entitled to take part in this governance and the Commission has a duty to indicate how and to what extent. The Open Science Policy Platform (OSPP) could be helpful.

4.8 The EESC proposes that wide-ranging consultations be launched, directly involving the scientific community and associations representing people's interests, on questions such as governance, the progressive opening up to all and arrangements for data use and preservation.

4.9 The Commission must in particular provide more detailed information on the administrative platform for managing the cloud.

4.10 The EESC considers funding to be an absolute priority for Europe in the light not only of the large number of countries in which it is to be implemented, but also of the economic backdrop of low growth in Europe, which hampers private investment in a European initiative that will in practice have only an indirect and secondary impact on industry and SMEs.

4.11 Businesses would effectively benefit from the positive effects of the cloud and data infrastructure only once it begins operating in compliance with common technical standards that are still to be defined, and within a legislative framework on privacy, cybersecurity and intellectual property that has not yet been consolidated in EU law or transposed into the Member States.

4.12 In this regard, the EESC proposes that a "single digital Europe portal" be set up, so citizens and businesses have ready access to relevant EU texts.

Brussels, 21 September 2016

Georges Dassis
The president of the European Economic and Social Committee