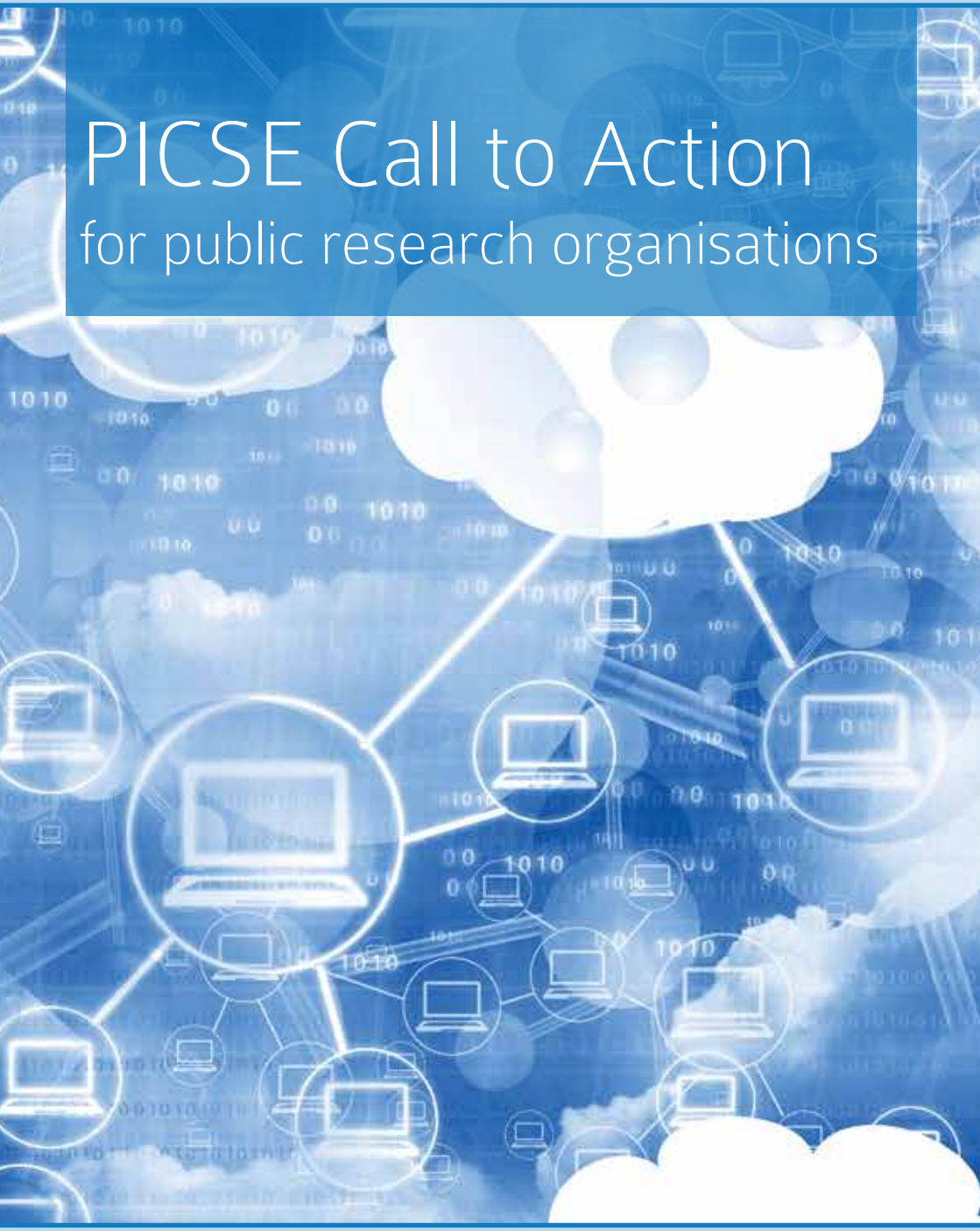
PICSE Call to Action

for public research organisations



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Call to Action

The following recommendations constitute a 5-part "Call to Action" for 'mainstreaming' cloud-computing in the ERA in line with the European Cloud Initiative which was launched as part of the Digital Single Market Strategy. Public research sector organisations, cloud services providers and policy makers are the major stakeholders in both of the strands of the initiative: an Open Science Cloud[1] and a Data Infrastructure. These recommendations have been formulated to reduce the 'cost of entry' for those stakeholders. They take into account a baseline in terms of the capacities in the marketplace today and the expectations of the key stakeholders consulted during the PICSE project.

- Part 1: Competences and organisational culture
- Part 2: Enabling innovation in procurement and services
- Part 3: Stimulating the research cloud ecosystem
- Part 4: Moving towards commoditisation
- Part 5: Validating the benefits

These recommendations can be implemented within the timeframe of the DSM strategy, subject to resolution of three constraints identified in the 2012 communication on "Unleashing the Potential of Cloud Computing in Europe[2]": fragmentation, lack of legislative harmonisation and the plethora of standards. Several of the recommendations specifically need to address these constraints.

Recommendations

Part 1: Competences and organisational culture

Recommendations for public research sector organisations

1. Build internal competences for cloud procurement and share requirements & best practices

a. Share experiences, best practices & lessons learnt from procurement with other organisations representing both supply and demand. Case studies documented by the PICSE project will be maintained for the next three years[3] and could become the reference point for cloud procurement use cases and best practices just as the Joinup library is the reference point for ICT open standards[4].

1 https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud
2 COM (2012) 529: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0529:FIN:EN:PDF
3 http://www.picse.eu
4 https://joinup.ec.europa.eu/community/open_standards_ict/og_page/best-practices-library

b. Move to e-procurement practices. Some public research organisations still require printed documents which do not match with the current practices adopted by cloud service providers. This can be easily circumvented by purchasing through a financial cloud broker that is set up to deal with organisations subject to these procurement practices.

c. Revise eligibility (qualifying) criteria for suppliers to reflect commercial cloud practices rather than relying on traditional criteria for purchasing ICT.

2. Adopt cloud-specific standards and identify these in procurements

a. Adopt standards which improve transparency and comparability for users of services while allowing suppliers to present their unique selling propositions. They help open up new markets for suppliers and offer equal access conditions, particularly for small and medium-sized companies. There are different cloud standards guides available such as: the NIST Inventory of Standards Relevant to Cloud Computing[5], the CloudWATCH Cloud Standards Guide[6] and cloud standard profiles[7], and the Cloud Standards Wiki[8]

3. Validate and use standard templates for tenders with standard contract templates and SLAs

a. Adopt standard templates, agreed between suppliers and their customers, in the procurement process, including agreed terminology, metrics and mediation procedures. This helps to ensure that the service level regime meets the requirements of the organisation and offers adequate compensation when service levels are not met.

b. In the absence of a single standard cloud framework, refer to EC-funded initiatives that are working to make available standard tools to facilitate the process of procuring cloud services.

- The PICSE project has developed a web-based application, the PICSE Wizard[9], to guide procurers and IT managers through the cloud procurement process and a Guide to Cloud Procurement which is available as an annex of this document.
- The main objective of the SLALOM project[10] is to create a Service Level Agreement (SLA) reference model consisting of model contractual terms and model technical specifications. It has just released the SLALOM SLA model terms and specifications emerging from the analysis of a set of metrics (Service Level Objectives).
- The SLA-Ready project[11] makes available a comprehensive guide on cloud SLAs across the entire cloud service lifecycle. This will include a set of user-friendly guides based on a common reference model. The common reference model also encourages CSPs to be more transparent and use standard SLOs.
- The SPECS project[12] is helping customers to map their security requirements and monitor performance.

5 http://collaborate.nist.gov/twiki-cloud-computing/bin/view/CloudComputing/StandardsInventory
6 http://www.cloudwatchhub.eu/cloud-standards-guide
7 http://www.cloudwatchhub.eu/cloud-standards-profiles
8 http://cloud-standards.org/
9 http://wiz.picse.eu/
10 http://slalom-project.eu/downloads
11 http://www.sla-ready.eu/
12 http://www.specs-project.eu/

» Through its hub[13], the CloudWATCH2 project makes available for easy consultation a set of tools and guides for public authorities and research organisations.

Recommendations for cloud services providers

4. Invest in the end-user facing services and in training next generation of researchers

a. Leverage the investments already made in the public sector and commercial cloud services. Cloud service providers must not simply rely on their customers to invest in end-user facing services and in training the next generation of IT-savvy researchers. Suppliers in the public and commercial sectors must invest in human capital as well as the technological building blocks for the development of cloud services. This will also contribute to acceleration of cloud adoption.

Recommendations for policy makers

5. Educating buyers and consumers on cloud computing

a. Address the skills gap that currently exists[14] and which will continue to constrain the potential of the Digital Single Market unless addressed decisively. Organisations with a strong understanding of cloud computing from the technical, legal and procurement perspective are much better prepared for procuring cloud services and have a higher success rate. The Commission should continue to work with industry to sponsor increased numbers of training opportunities and skills-based resources, and to promote awareness of inclusive cloud education.

Part 2: Enabling innovation in procurement and services

Recommendations for public research sector organisations

6. Review internal procurement policies and make tenders SME-friendly

a. Change internal polices to regulate the procurement of cloud services provided by commercial cloud services providers (CSPs) and make procurement more easily accessible to smaller and medium-sized enterprises as well as larger companies.

b. Create strategic, agile procurement practices with more flexible and less complex procurement strategies. This moves away from 'one-size fits all' tenders and fixed-term panel contracts which lock out suppliers for long periods.

7. Encourage innovation and competition

a. Strengthen and widen dialogue with the supply-side. This will make public research organisations more aware of the latest solutions available on the market while private and public cloud service providers and cloud brokers will become more aware of their customers' needs. Engage early with suppliers when planning procurement and publicise tenders effectively.

13 http://www.cloudwatchhub.eu/

14 European Commission, "Grand Coalition for Digital Jobs", April 2015, available at: https://ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs

b. Adopt outcome-based procurement practices to meet business objectives instead of detailed technical specifications and focus on 'value for money' over 'least cost'. Look for good fit commercial off-the-shelf (COTS) services.

c. Use Pre-Commercial Procurement & Public Procurement of Innovation practices as instruments for innovation.

Recommendations for policy makers

8. Establish a cloud chapter in the European Assistance For Innovation Procurement (EAFIP)[15]

a. Consider innovation procurement as an instrument to procure the innovative cloud services needed by public sector organisations. EAFIP promotes the benefits of innovation procurement, providing assistance to public procurers with a concrete interest in implementing innovation procurements of ICT based solutions across the EU. This could be used to train research organisations on the innovation procurement instruments. It could leverage on the knowledge collected and produced for the PICSE platform and it could collect all the lessons learnt and results coming from the Cloud for Europe[16] and HNSciCloud[17] PCP projects. In this way it could become the predominant cloud procurement innovation portal for both public administrations and the research sector.

Part 3: Stimulating the research cloud ecosystem

Recommendations for public research sector organisations

9. Engage the industry and manage relationships with multiple suppliers

a. Use an appropriate vehicle to engage with suppliers, both from the private and public sectors. Participants should be committed to develop a shared vision and a shared action plan. The Helix Nebula Initiative (HNI)[18] is a forum with a well-defined governance model[19] that is open, transparent and supported by both private and public entities. This allows rapid responses to changing circumstances when necessary, less common in the public sector than among their suppliers. It provides a range of activities to establish an open standards-based ICT service marketplace serving, initially, the publicly funded research sector and related industries. Public research organisations can join it free of charge[20].

10. Adopt standards to improve the quality, security and sustainability of products and services

a. Enable interoperability between services, portability from one provider to another and trust in the integrity (provenance, reliability, etc.) of the services on the part of their users. The adoption of open standards such as Topology and Orchestration Services for Applications (TOSCA[21]) can alleviate concerns about vendor lock-in and allow users to move data and applications between multiple cloud service providers at low cost and with minimal disruption.

15 http://eafip.eu/
16 http://www.cloudforeurope.eu
17 http://www.hnscicloud.eu
18 http://www.helix-nebula.eu
19 http://www.helix-nebula.eu/sites/default/files/files/HNI%20Governance%20Model_2015.pdf
20 http://www.helix-nebula.eu/become-new-member
21 http://www.cloudwatchhub.eu/cloud-standards-guide

Recommendations for cloud services providers

11. Engage with demand side to understand the needs of the market

a. Participate in an open forum where cloud service providers and cloud brokers can collectively develop a clearer insight into demand-side needs. As mentioned above, HNI represents a good forum where public and private Cloud Service Providers (CSPs) can meet users and, significantly, each other (see recommendation 12, below). Cloud service providers can join free of charge[22].

12. Create a working economy between suppliers rather than always competing

a. Establish a dialogue with other suppliers for a common understanding of what is meant by 'the cloud'; what is expected, roles and responsibilities, and interoperability between different solutions. This will stimulate the market for services, with better customer alignment and will create a truly harmonious ecosystem that will expand the size of markets in which cloud providers operate, with customers who are secure in the knowledge that they can change providers, or use multiple providers, without significant technical challenges or effort. Currently the Helix Nebula Marketplace (HNX)[23] is trying to set up such cloud provider ecosystem.

Recommendations for policy makers

13. Create a unique European catalogue of cloud service providers and related services for science

a. Establish an inventory of European cloud service providers which can be developed and maintained by and for the research stakeholder community. Procurers need to find the best solutions available on the market that fit with their requirements and to compare offers and pricing of different providers. Public research organisations commit significant time and resources to intensive market research analysis because there is no unique reference database of European cloud service providers and their offerings. We recommend that this action be incorporated in the European Open Science Cloud strategy. Establishing shared eligibility criteria for the suppliers that could become part of the catalogue can improve standardisation and increase trust from the research sector.

b. Make sure that providers are correctly classified on the basis of the services that they provide, the certifications that they have, and the geographical coverage of their offer. A shared catalogue should replace the typical eligible supplier database that procurement offices in every single research organisation currently commit significant resources to maintaining and keeping accurate. Currently there is an initiative that is trying to set up a cloud provider catalogue, Cloud 28+[24].

c. Capitalise on previous investment by encouraging adoption of project outputs and establish terms and conditions for reuse. Where common and open standards are not yet available, initiatives will run the risk of duplicating development effort unless they are made aware of suitable products and services. Where suitable, these results can be added to the catalogue of cloud services.

22 http://www.helix-nebula.eu/become-new-member
23 http://hnx.helix-nebula.eu/
24 http://cloud28plus.eu

Part 4: Moving towards commoditisation

Recommendations for public research sector organisations

14. Implement pay-per-use procedures

a. Introduce the possibility to allocate fractions of research grants to the use of cloud computing. This can facilitate and speed up the adoption of cloud computing especially for small medium research sector organisations that do not have the resources and the competences to afford huge procurement actions.

Recommendations for cloud services providers

15. Establish transparent cloud pricing within clear and publicly available service descriptions

a. Discourage practices that make it unnecessarily difficult to compare 'like with like'. The cloud computing market lacks transparency. There are no common units of measurement to determine market share by volume sold or by revenue since cloud providers are not consistent in terms of what should or should not be included as "cloud sales" for market definition purposes. The public sector must feel confident that they can identify inappropriate market behaviour, which is difficult in a market that lacks transparency.

Recommendations for policy makers

16. Enable construction of a bottom-up federated cloud for commodity services

a. Take a bottom-up approach to building a federated hybrid cloud, essential to get the core technical, financial, and policy principles right. Start with commodity services and a federated identity management system offering a single sign-on facility to access common services across all suppliers. IaaS can be introduced without impacting higher-level user-facing services that will require a significant software investment. It also represents a strategy with lower risk because the IaaS market is more mature than the PaaS and SaaS markets. As outlined in the EIROforum open science cloud paper[25], "**a European Open Science Cloud should take a bottom-up approach to implementation, starting with IaaS. It should also be founded on a bedrock of federated IaaS vendors, choosing the interface for maximum interoperability.**"

Part 5: Validating the benefits

Recommendations for public research sector organisations

17. Experiment in the cloud through free trials and small pilots

a. Use small cloud pilots to test various cloud providers and service models in order to understand what can be achieved and what real benefits and real costs are involved.

25 http://dx.doi.org/10.5281/zenodo.34264

Recommendations for cloud services providers

18. Offer free, standalone tests

b. Allow prospective buyers to verify the suitability of the services the need by helping them to create Proof of Concept trials with minimum or no contractual obligations, costs or risks.

Recommendations for policy makers

19. Use the INFRADEV-04-2016 call to pilot a federated IaaS cloud ecosystem

a. Build on the existing and planned e-infrastructures and integrate these with commercial cloud services in order to deploy a pilot federated European Open Science Cloud that spans a critical mass of existing research infrastructures and scientific clouds.

20. Establish calls for joint procurement actions focused on SaaS and PaaS services.

a. The HNSciCloud Pre-Commercial Procurement (PCP) project[26] provides a vehicle for joint investment in IaaS services and a similar approach should be envisaged for higher-level software services. In order for the research community to be able to benefit fully from the existence of a European Open Science Cloud, it has to expand beyond the basic IaaS level and provide services that are closer to the needs of the daily work of a researcher. The natural follow-on step for successful PCP projects is to procure at a larger scale with Public Procurement of Innovation (PPI) co-funded projects that could significantly increase the capacity and impact of the resulting cloud based platform.

Longer-term harmonisation

One barrier stands apart in the Digital Single Market strategy which is the urgent need for harmonisation of regulations across the Member States, especially in terms of public procurement and data protection. These are structural constraints that will inhibit cross-border procurement and information flows. Clarification of roles and responsibilities such as data-controller and data-processor is required in order to fulfil some of our recommendations in this Call to Action and an advisory mechanism is required in order to clarify the exposure to risk that will apply until harmonisation is achieved.

An unique framework for cross-border procurement.

Different countries have different procurement regulations that can inhibit cross-border procurement. The longer this situation persists, the slower the public sector take up of cloud computing will be. We advocate the establishment of a cloud procurement agency for Europe, based perhaps on the experience of the UK G-Cloud (Digital Marketplace)[27]. This agency could provide a cross-border cloud procurement framework similar to the way that PICSE did for consortia for the last ICT procurement calls (ICT8). The cloud procurement agency would declare joint procurements it is willing to coordinate, collect interest from public procurers and, if there is critical mass, launch the tender. In the case of innovative services, procurement can potentially take the form of a PCP/PPI with EC backing.

26 http://www.hnscicloud.eu

27 https://www.digitalmarketplace.service.gov.uk/

Harmonisation and simplification of public procurement rules & data protection legislation.

Draft regulation addresses some concerns but needs to be followed by cloud-specific guidelines for use in the public sector. Attention needs to be paid, in particular, to the way that roles like data controller and data processor are defined, since these often do not correspond to the reality of a cloud environment. EC-funded initiatives such as SLA-Ready and CloudWATCH2 have built up legal expertise in Europe and can provide some guidelines on a freemium basis (where core material is provided free and a charge is made for added-value services).

Disclaimer

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European Commission

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