Cloud computing

**Why Invest in Cloud Computing?**

The defining feature of cloud computing (CC) is that cloud users, including public administrations, SMEs and non-profit organisations, do not need to invest substantial amounts of money in IT infrastructure, but pay for actual usage, according to current demand. This translates into a major reduction of costs for public administration, easier access to state-of-the-art technologies and flexibility for increasing IT capacity on a need basis. This is a major advantage given the steep rise in demand for computing power. It can be difficult to absorb substantial expenditures on in-house ICT infrastructure to offset growth.

Moreover, the take-up of cloud computing services contributes to a more cost-efficient public administration through e-government. Cost savings are mainly based on standardisation and system integration, as well as economies of scale and flexibility to use the resources that are needed at a particular point in time. However, the benefits are not limited only to the public administration. A broad adoption of cloud services increases the participation of SMEs in public procurement, especially in markets which have been previously highly concentrated. Thus, companies gain easier access to new markets and sectors. This drives competition, creates innovation and reduces the costs of IT procurement.

In terms of macroeconomic benefits, CC offers a strong productivity boost for companies and the European economy. It is a core driver for innovation and can enhance industrial strength (high-end computing, gaming, engineering etc.). Work can be done more quickly, more efficiently and in a cost-effective manner. CC advances the revolution that ICT has started, users can access their content, and use their software when and where they need it, e.g. on desktop computers, laptops, tablets and smartphones, as long as there is a sufficiently robust broadband Internet available. Moreover, it can help organisations to reach out to their communities.

According to an IDC study\(^1\) 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.

**Barriers & Challenges**

Possible barriers exist both in terms of hardware and software. Only a few large data centres for CC are likely to be truly successful given their economies of scale. However there is a potential for different players in establishing niche services. Another barrier pertains to the choice of leasing or buying hardware. Leasing costs are much more difficult to estimate. Finally, when it comes to software it is important to choose cautiously between expensive tailor-made solutions or standardised cost-efficient solutions that can be up-graded gradually and have low starting costs. This latter option is often the best choice for e-government solutions at local and regional level.

CC entails both local and global challenges. Local providers may be disadvantaged compared to other large service providers from abroad. This reflects the highly competitive global market for CC and the possibility of easily outsourcing to other countries and regions worldwide.

Furthermore, there is a barrier in financing cloud projects through structural funds, as it consists of an operational expenditure (OPEX) and not capital expenditure (CAPEX). There are currently being developed different models to address this.

### HOW TO ACT?

1. **Analysis**: Regional and national authorities should first survey which opportunities and capabilities they have.
   - Broadband constitutes the physical backbone for cloud computing.
   - Data centre provision would be appropriate in a limited number of regions with a good broadband backbone and specific local attributes (e.g. water or renewable energy resources for cooling servers, or specific ancillary skills for running software as Software as a Service). The large data centre in Hamina, Finland, is a recent example of this.
   - Large data centres have several advantages: better quality, newer equipment and high utilisation rates (70-80% compared to 20% in more fragmented data centres).
   - Other regions should identify the closest data centres and analyse the resulting opportunities.

   Regions can also ask for guidance from their national government on (a) the usage of cloud computing and services, (b) the development of migration plans to the cloud, and (c) risk assessment (legal compliance, business risk, identify small pilot projects that can be scaled-up).²

2. **Governance/Stakeholder involvement**: In this process, involving key stakeholders and creating appropriate governance mechanisms is very important. Relevant stakeholders are SMEs, large firms (especially chief information and financial officers), finance and administration departments in the public sector, IT procurers, local authorities, software companies and systems integrators. Relevant networks are Euro-CIO, CIO-NET, and Eurocloud which is mainly business-driven.³

3. **Priority setting**: These actors, together with the ones in charge of the strategic framework, should identify what kind of application priorities to focus on. Common applications are e-mail, customer management/websites, Internet platforms and burst stability (backup in cases of outage or other emergencies).

4. **Policy mix**: The next step is to develop a roadmap, with accompanying activities and policies to drive cloud adoption among public administrations and to align with private actors, national,

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regional and EU policy programmes and activities. Such activities would include all the activities that are designed to drive cloud use, such as common technical requirements, drafting cloud strategies at local level, creating common provisioning platforms, or building platforms for the exchange of best practices at national level. It should be associated with H2020 priorities in relation to cloud, e.g. software, advanced computing, e-government, security and trust, environment and smart cities.

Given the highly competitive market, it is important to have an outward looking dimension and seek synergies between public administrations, as well as external actors. The European Cloud Partnership (ECP) explored the synergies at European level by coordinating activities and implementing actions using pre-commercial procurement. In 2014, the Steering Board of the ECP published its vision on how to help public and private organisations in Europe to buy and sell cloud services⁴.

Moreover, in May 2015, the Commission adopted a Digital Single Market Strategy⁵, which aims to maximise the growth potential of the digital economy through among others two actions related to cloud computing: the free flow of data (which will address data location restrictions that artificially limit the cross-border flow of data) and the European cloud initiative (which will include cloud services certification, contracts, switching of cloud services providers and a research open science cloud).

The Commission is currently consulting⁶ on the initiatives to collects views and better understand the issues. The consultation is open until 30th of December 2015.

Inter-operable solutions should be sought in order to avoid lock-in and promote competition.

5. **Evaluation and Monitoring:** The strategies should also incorporate monitoring and evaluation mechanisms, in order to facilitate flexibility in programming management and learning. A typical indicator used in this area is the percentage that public sector and local businesses spend on cloud computing and the share of IT professionals.

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**Further Reading & Forthcoming Events**


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