



Advanced Technologies for Industry

Harnessing the Cloud-Driven Revolution: Trends, Challenges and Opportunities

4th February 2021, 10.00 – 12.30 Virtual event

Organised on behalf of:

European Commission DG GROW

Executive Agency for Small and Medium sized Enterprises (EASME)

By IDC

The event “Harnessing the Cloud-Driven Revolution: Trends, Challenges and Opportunities” was the second in a series of three events organised within the Advanced Technologies for Industry (ATI) project (<https://ati.ec.europa.eu/>) commissioned by EASME and DG GROW. The aim of these workshops is to properly inform relevant stakeholders (policy makers, cluster organisations, national and regional authorities, SMEs) on latest project findings on specific advanced technologies and boost the discussion on related adoption barriers and opportunities.

This second workshop focused on Cloud computing and in particular explored the main trends, policies, initiatives and services that are being developed to foster cloud computing adoption, discussing on the impact those initiatives have on end users, especially SMEs. Cloud services have become the de-facto source of digital transformation for enterprises in every industry and the preferred IT consumption model for consumers. Until now, European cloud and IT service providers have been operating in the shadow of global cloud players, but new opportunities are emerging for them as the market evolves. European enterprises and developers interested in using cloud services need to be aware of evolving technology and supply trends to make the best choices concerning the cloud platforms and infrastructures they need to support their digital transformation journeys. The workshop fed directly into this particular context.

Welcome and introduction to the ATI project

Marta Batalla Masana, Policy Officer, DG GROW, European Commission

Marta Batalla Masana welcomed the audience and briefly introduced the ATI project and its current implementation supporting the EU’s industrial policy, with a systematic monitoring of technological trends and reliable, up-to-date data on advanced technologies. More in detail, the ATI project is providing:

- Analytical reports on technological trends, sectoral insights and products.
- Analyses of policy measures and policy tools related to the uptake of advanced technologies
- Analyses of technological trends in competing economies such as in the US, China or Japan.
- Access to technology centres and innovation hubs across EU countries.

Advanced Technologies: Cloud computing adoption and industry trends – Gabriella Cattaneo, IDC

Gabriella Cattaneo presented the main findings of the AT Watch report on Cloud Computing. Public cloud computing is evolving from a generic way to access additional computing power to a hybrid computing environment realising the everything-as-a-service provisioning concept. As revealed in ATI survey analysis, cloud is the instrument chosen by most enterprises to deliver services and applications based on Big Data, IoT and artificial intelligence. To deal with increasing demand for real-time processing capabilities, computing power and data scalability, cloud offerings are evolving rapidly. They will require adaptation capability by European enterprises, particularly SMEs, but also offer new opportunities. Even though the recession caused by the COVID-19 pandemic has negatively impacted IT investments, cloud spending has been resilient in 2020, with the majority of European enterprises expecting no reductions, or even an increase, in spending on cloud services:

- Finance, manufacturing and professional services account for 52% of spending in 2020.
- Total worldwide spending is forecast to grow to €581 bn by 2024.
- The European market (WE) is expected to grow as fast as the global market with a constant share of 19% on global spending from 2019 to 2024.

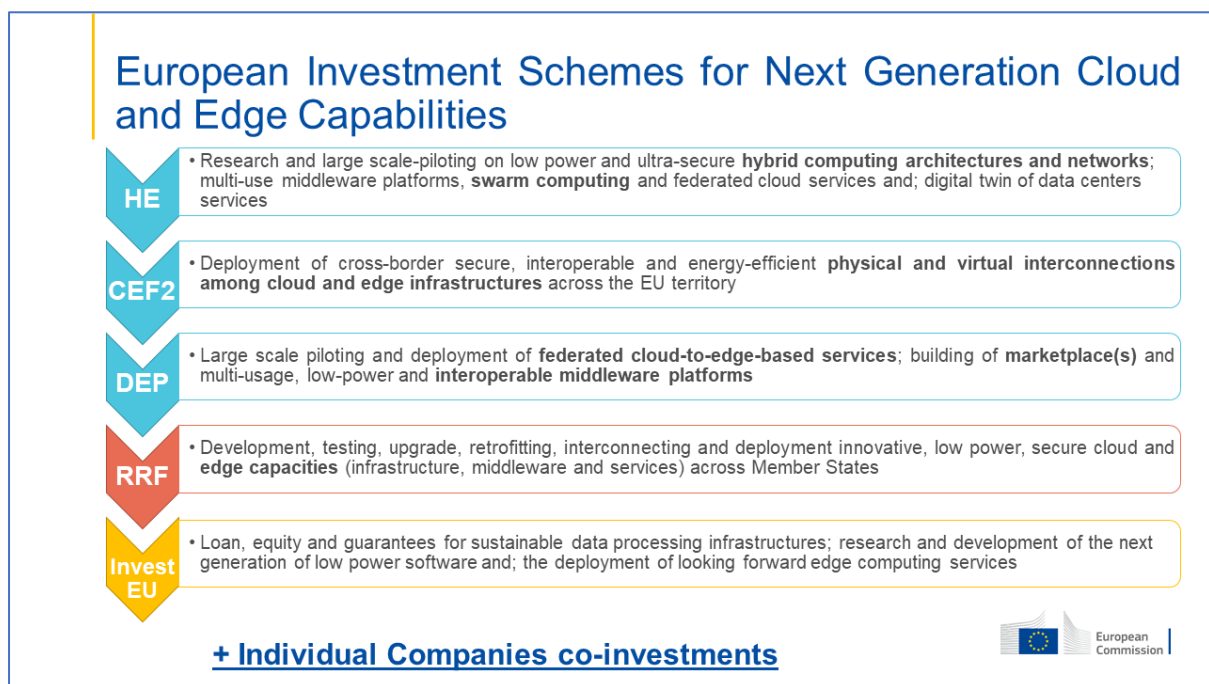
Mrs. Cattaneo also highlighted the main trends evolving in the cloud computing arena:

- Multicloud models are converging and by 2021, over 90% of enterprises worldwide are expected to rely on a mix of on-premises/dedicated private clouds, several public clouds and legacy platforms to meet their infrastructure needs.
- Edge/cloud infrastructure balance will switch from today's 20% data at the network edge and 80% in cloud-based infrastructure to 80% at the network edge and 20% in cloud-based infrastructure. As a consequence, technology suppliers and end-user organisations are looking at edge innovation to gain business benefits.
- Alternative cloud models based on federated cloud services. To escape the high scalability costs and customer lock-in issues of the global cloud providers now dominating the market, the EU is promoting alternative cloud federation models based on cloud interoperability and seamless connectivity. From the technical point of view, decentralised architectures represent an increasing trend in the ICT environment – not only in cloud computing, but also in IoT, 5G, blockchain-based security and distributed AI.
- Environmental sustainability. The last years have seen great progress in cloud datacentres energy efficiency but further progress will be harder as the potential for additional gains is getting smaller. Global hyperscalers have invested heavily in sustainability strategies and all of them boast of their achievements and renewable energy investments. But the increase of demand and the instalment of additional capacity in these huge data centres is forecast to continue driving increased energy consumption. The emergence of edge computing and federated or distributed cloud services will meet some of the emerging demand, but this trend poses new sustainability challenges which also need to be met. Distributed cloud services may have more difficulty in principle in achieving energy efficiency than centralised data centres.

The presentation from Manuel Mateo Goyet focused on the strategic importance played by cloud in the framework of the European Strategy for Data. Cloud is considered crucial for the following reasons:

- It accompanies businesses and public sector in their digital transformation and enables to cut costs.
- It processes and stores data (we are generating increasing volumes of personal and non-personal data, which we need to process and store, if we want to make the most out of it)
- It provides the infrastructure and services to reap the full potential of the data economy.
- It is a strategic asset to run securely technologies like 5G, AI, IoT.
- It is essential for Europe's technological leadership, given the importance of data and its benefits.

Mr. Goyet also shared how the European Commission plans to invest in the next generation cloud and edge capabilities, as shows the image below.



Cloud security for healthcare services - Athanasios Drougkas, NIS Expert, Secure Infrastructures and Services Unit, ENISA

ENISA considers cloud services as an enabler for cybersecurity because moving to cloud means additional protection. The contribution from Athanasios Drougkas focused on a recently published report on cloud security for healthcare services. The study aims to provide cloud security practices for the healthcare sector and identify security aspects, including relevant data protection aspects, to be taken into account when procuring cloud services for the healthcare industry. The main treats that healthcare services face include:

- Natural phenomena
- Supply chain failure
- Human errors
- Malicious actions
- System failures.

Cloud could support efficiently healthcare service in relation with the abovementioned treats; nevertheless, some challenges need to be taken into account, such as the lack of trust in cloud solutions, the lack of security/technology expertise, the integration of cloud and legacy systems and data protection. Through the identification of three use cases (electronic health record, remote care and medical devices), the study identifies 17 security measures and their application per use case.

The main conclusions of the study are listed below:

- Cloud may be the next step in eHealth digital transformation
- Cloud adoption still low - many challenges remain (trust, expertise, compliance, etc.)
- Specific guidance from EU and national authorities to healthcare organisations is needed
- European Union Cybersecurity Certification Scheme on Cloud Services (EUCCS) as an important step towards the improvement of cloud security in a healthcare context.

Q&A

Q1: What are the legal issues that may arise during cross domain cloud integration regarding Intellectual Property rights?

Answer from Mr. Goyet: IP is indeed one of the parameters to be factored in. Open source is often a way to go. Open Standards too. But they are not always possible to use, so yes, IP is something to be attentive to too.

Q2: Some more information on the green dimensions of cloud would be appreciated!

Answer from Mr. Goyet: we have set an objective to ensure data centres are climate neutral, highly energy efficient and sustainable by 2030. Many different streams of work are ongoing: the review of the energy efficiency directive (public procurement, energy audits), the taxonomy regulation (i.e. the financing of green data centres), or the Code of Conduct on green data centres, to name only a few.

Q3: Within the concept of the federated cloud, has it been considered yet the ability to ensure the traceability of the data handling and preventing the data leaking beyond our jurisdictions?

Answer from Mr. Goyet: traceability of data is indeed important and something that is considered under the governance of data spaces (for data spaces) and in the Data Governance Act and the forthcoming Data Act. When it comes to data leak beyond our jurisdictions, this is of course at the heart of our action. We obviously want to be as protective as possible, but we need to be mindful of a fairly complex legal system and trade and competition concerns.

Q4: How do you think security needs should be balanced with SMEs need to avoid slowdown in security certification process?

Answer from Mr. Drougkas: The Pan-European cybersecurity certification scheme offers harmonisation for the market. It represents the first scheme including sufficient flexibility for companies and SMEs in particular, with the aim of establishing simplicity and trust.

Moderated by Massimiliano Clap, Research Director, IDC

Mark Dietrich, Senior Advisor, EGI Foundation, H-CLOUD project

Mark Dietrich shared the work that the EU-funded project H-CLOUD is performing with the aim of developing a forum of European Cloud Community (ECC) stakeholders from cloud computing research, industry and users. The main objective of the project is to identify and address challenges and opportunities at research, technological, policy, standardisation and organisational level and to create a common vision of cloud computing, to unlock the potential of cloud computing in support of a Digital Single Market.

The analysis proposed by H-CLOUD focuses both on the supply and the demand side. On the demand side, EU cloud adoption is only slightly behind US; nevertheless, SMEs still face many challenges in the adoption of this advanced technology. The main reasons of failure are related to security, performance, skills and trust. On the supply side analysis, it is important to note that cloud adoption is a complex process within the framework of the digital transformation. In this context, hyperscalers at the moment play a dominant role over smaller EU players; their customers accept lock-in because the providers offer good solutions. From a technological standpoint, there is an exponential increase in data generated and processed, especially at the “edge” and it is clear that moving data to data centers is inefficient. In this context, an opportunity to change the game could be represented by moving away from data centers and as consequence from hyperscalers.

Radu Vunvulea, Group Head of Cloud Delivery, Endava Romania

Radu Vunvulea focused his contribution on two main topics: the impacts of COVID-19 on cloud adoption and the cloud legal implications considering the current trends (i.e. edge computing). With regard to the first point, during COVID-19 pandemic, companies of different sizes had to face different challenges:

- small companies had to look around and scale up to fulfil customer needs and found in cloud one option to that
- large companies asked themselves if multicloud solution would have been a good one even if more expensive than other
- start-ups started to look for cloud providers and some of them started building their own infrastructures.

When talking about the impact of edge computing, Mr. Vunvulea highlighted that there is a lot of concern on data privacy. In 2025 we might have around 80% of data stored in smart devices and 20% in centralised data centers.

According to Radu, an open marketplace for cloud services would make easier for companies to find services.

Catherine Nohra China, Founder, B2cloud

Catherine Nohra China highlighted how the lack of visibility is a major obstacle for EU providers facing the strengths of the hyperscalers. The solution and at the same time the challenge would be to provide a new business model to better compete with them. The

keyword in this context is the marketplace for cloud to edge service meeting requirements for data protection, security, portability.

There is a new trend in France related to the so-called “availability zone” or “proximity cloud”: it is a new way of providing services with low latency to customers. The main issue here is that hyperscalers are trying to get in the market through this availability zone; the federated cloud, according to Mrs. Nohra China, would be a good answer to let EU providers to gain importance in the EU market.

Roberto Beneduci, CEO, Coretech, Italian member of Digital SME Alliance

The contribution from Roberto Beneduci focused on the importance of providing an alternative to big tech corporations. According to Mr. Beneduci, skills and proximity in IT are the best allies for companies to support their technological growth: local partners can better help customers because they have a better overview, understanding of the customers’ need and can offer better services as a consequence. An important point to take into consideration when choosing hyperscalers’ services is related to regulatory compliance: usually all service agreement fit US laws and not necessarily other countries’ regulation. Choosing a local cloud provider entails the following advantages:

- Data Security
- Safe Advantage with patents and industrial secrets
- Best conformity to local Law
- 100% GDPR Compliance
- Technical support closer to company needs
- Improvement of the local ecosystem
- Increase in customer country GDP.

Brainstorming discussion with Mural

Through the help of a digital whiteboard, speakers and audience brainstormed on some further questions related to Cloud Computing.

How do you think cloud federation as an ecosystem of excellence could create value and have a positive impact especially on SMEs?

Feedback 1: Many people want a solution which can bring business value; to do that, organisations look for a business partner or for a provider. The federation can give an added value and its main challenge is not represented by technological or business model issues. The main challenge is how different organisations manage to work together. Even with a marketplace, there need to be rules.

Feedback 2: Federation requires the partners to agree how to work together to allow an integrated offer. If this can be done, it might be a good alternative to make customers integrate the pieces themselves!

Feedback 3: An identity federation should be followed by a data federation. The challenge is to convince cloud vendors to use the same federated solution; when talking about users, they should not have problems in using different solutions within the federation. A protocol could help in shaping the structure and help the implementation of the federation.

Policy is playing a central role in shaping the European cloud market; how do you think should develop to further support EU businesses?

Feedback 1: The EU Cloud rulebook for cloud services is starting to get shaped and could represent a very good support on how organisations should design their infrastructure and services.

Feedback 2 (EC): Providing a European marketplace is something which the EU plan to finance. Call for proposal should be launched in Q2 and first funding still this year.