

## **AIIP response to the “Public consultation on BEREC Report on Cloud and Edge Computing Services” of 7 March 2024 - BoR (24) 52**

*April 24<sup>th</sup>, 2024*

Associazione Italiana Internet Provider (“AIIP”) is an association of Italian operators active in the provision of IP based services and namely in the provision of communications networks and services (“ECN/S”), at wholesale and retail level, as well as providers of cloud and edge services.

AIIP members are many UBB access providers with fixed and wireless technologies (FTTH, FTTC, FWA) as well the largest Italian cloud service providers.

AIIP represents in this public consultation both the interests of ECN/S suppliers of connectivity to cloud and edge service providers (“CSPs”) as well those of CSPs competing with the hyperscalers who dominate cloud and edge service markets worldwide.

Therefore, AIIP provides a balanced view, from both ECN/S providers and CSPs points of view.

Some introductory remarks are necessary for an adequate understanding of AIIP answers to BEREC questions under consultation.

### **1. Introduction. Integration to BEREC economic market analysis of cloud services.**

**1.1** Cloud is a very large market, no longer limited to hosting and caching and, by virtualizing physical assets, it also includes: infrastructure as a service (“IAAS”), platform as a service (“PAAS”), software as a service (“SAAS”) and many other “tools” as a service...

Almost everything is now being virtualized and transformed into a service though cloud (including infrastructure, which became a commodity before virtualizing). This gives a clear idea of the enormous value, actual and even more in perspective, of cloud services, as well as the economic rationale of possible anticompetitive behaviours, such as exclusionary conducts and attempts to monopolize the market.

AIIP appreciates the economic analysis of the economic structure of cloud and edge services market made by BEREC, which has highlighted that:

- i. Cloud services and cloud marketplaces are featured by strong direct and, especially, indirect “network effects”<sup>1</sup>: the larger/spreader is the customer base of CSP, the larger is the number of system integrators which

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<sup>1</sup>*“In economics, a network effect ... is the phenomenon by which the value or utility a user derives from a good or service depends on the number of users of compatible products ... The adoption of a product by an additional user can be broken into two effects: an increase in the value to all other users (total effect) and also the enhancement of other non-users' motivation for using the product (marginal effect). Network effects can be direct or indirect. Direct network effects arise when a given user's utility increases with the number of other users of the same product or technology, .... Direct network effects can be seen with social networking services ... telecommunications ... Indirect ... network effects arise when there are “at least two different customer groups that are interdependent, and the utility of at least one group grows as the other group(s) grow”. For example, hardware may become more valuable to consumers with the growth of compatible software.”* ([https://en.wikipedia.org/wiki/Network\\_effect](https://en.wikipedia.org/wiki/Network_effect)).

are attracted by that cloud platform and specialize in that CSP to give assistance to final customers and then the larger is the number of Independent Software Producers (ISV) which adapt their own technologies to operate on a specific cloud system (e.g.: AWS or Azure or Google Cloud). This will attract new clients on a cloud platform which will boost this concentrative dynamic circle... This is known as “winner takes it all” economic theory<sup>2</sup>.

- ii. the above referred concentrative dynamic is also boosted by the large scale and scope economies which feature cloud services and cloud marketplaces (which thanks to virtualization of physical assets, can provide a enormous array of items and achieve enormous scope economies).

This concentrative dynamic is also strengthened by other factors proper of cloud and edge services as they provide organizations with the ability to scale their computing resources and storage (very useful in the present data explosion) as needed, and offer flexibility, cost efficiency, accessibility, they also provide answer to security and privacy concerns, and solutions to the growth of IoT, etc.. These factors collectively contribute to the increasing adoption and evolution of cloud and edge services in various industries;

- iii. cloud services have a substantial “lock-in” effect with respect to their customers which impede competition (not only between cloud service providers, at advantage of hyperscalers, but also between virtualized infrastructures offered by cloud providers and physical infrastructure provided by electronic communications operators).

**1.2** In order to answer to BEREC questions, in addition to the above, AIIP deems necessary also to keep into account the following economic features relating to cloud and edge computing services in order to fully understand and assess the relationship between CSPs and ECN/providers and the need and extent of any regulatory intervention.

- iv. hyperscalers have strong demand-side market power: the largest CSPs (Amazon AWS; Microsoft Azure and Google Cloud) purchase in large volumes the items necessary for their own activity or for resale through their platforms and may “squeeze” their suppliers and have lower costs and resale price that other CSPs.

This allow the hyperscalers to have a large quantity of virtualised items to sell on their platforms. In addition, one should consider that the greater is the quantity of services sold to each client, the larger scope economies are achieved by cloud providers and the more it is likely a lock-in effect for the client.

- v. hyperscalers have their own AI platforms or are integrated with AI providers (e.g., Microsoft Azure announcement as the exclusive cloud provider for OpenAI to run its AI services including ChatGPT)<sup>3</sup> and will benefit from the growth of AI more than other competing CSPs;
- vi. hyperscalers may practice “cross-subsidies” among their different lines of business: AWS is selling its “lambda” connectivity at loss and is financing it with the gains from virtual equipment and storage; MICROSOFT is subsidizing Azure with the gains from “Office 365” (sold as SaaS). Google Cloud: 5BLN \$ losses in Q1 2021, to enter the market...!!

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In this respect, it is necessary to consider that the growth of network effects, by adding a new participant to the network is not linear, but exponential, under “Metcalfe law” described in this formula:  $\frac{n * (n-1)}{2}$

<sup>2</sup> <https://www.forbes.com/sites/forbesbusinesscouncil/2024/03/05/understanding-the-dynamics-of-winner-take-all-markets/>

<sup>3</sup> [https://canalys-prod-public.s3.eu-west-1.amazonaws.com/static/press\\_release/2023/1725098181Worldwide-Cloud-Market-Q4-2022.pdf](https://canalys-prod-public.s3.eu-west-1.amazonaws.com/static/press_release/2023/1725098181Worldwide-Cloud-Market-Q4-2022.pdf)

- vii. hyperscalers, which are all US-based (Microsoft Azure, Amazon AWS, Google Cloud Platform, Oracle Cloud, and IBM Cloud), may benefit of very low taxation rates and make substantial profits in EU Countries but do pay only marginal taxes in EU with respect to their revenues<sup>4</sup>, different from ECN/S providers and EU CSPs.

As cloud marketplaces and app stores have the same market features and are both featured by large direct and indirect network effects, the former face the same risks of having the market dominated for a very long time by very few players (as IOS and Android in the smartphone operating systems market)<sup>5</sup>.

The cumulative effect of all the above factors in strengthening the hyperscalers position on the market with respect to other CSPs is enhanced by the lock-in effect which makes the cloud services market (which is subject to a concentrative dynamic) not contestable at all.

The result of this is that as of December 31, 2021, Google, Amazon and Microsoft together had a share of 69% of the market of cloud services. *For full-year 2022, total cloud infrastructure services spend grew 29% to US\$247.1 billion, up from US\$191.7 billion in 2021 → The top three cloud service providers accounted for 65% of total cloud spend in Q4 2022<sup>6</sup>*

### 1.3 Executive Summary:

AIIP agrees with BEREC that ECN/S and cloud and edge computing services are converging. However, as better explained in the following sections, there is a one-way direction only convergence from cloud and edge services towards ECN/S and the boundary between ECN/S and the CSPs is rapidly blurring.

Nowadays, while EU ECN/S providers are subject to regulation and to the provisions of the European Electronic Communications Code, US hyperscaler are not subject to any regulatory constraints in spite of the structure and the concentrative dynamic of the cloud and edge computing services.

AIIP thus exhorts the Commission to prepare a plane level field over which ECN/S providers and CSPs can compete for the benefit of EU business and consumers.

AIIP deems that this should be made possible also by an effective application of the package for regulating the digital sector and, namely, of the Digital Act the Digital Markets Act and the Artificial Intelligence Act.

In this regard AIIP agrees with BEREC that interoperability, standardization, and opening/publishing of APIs is pivotal for future competitive cloud and edge markets.

In addition to the above, AIIP proposes that:

- EU (as France has already done) limits the recourse to so-called “cloud credits” offered by hyperscalers CSPs to their customers as aimed at acquiring and fidelizing customers thanks to the strong lock-in effects, and that

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<sup>4</sup> Although not directly related to this consultation, according to AIIP in order to ensure fair competitive market conditions it is necessary that hyperscalers substantial profits made in EU are taxed in the Countries where they are produced and should not freely transit toward tax-free third Countries.

<sup>5</sup> As it has already happened, as one looks at cloud market shares and HHI

<sup>6</sup> [https://canalys-prod-public.s3.eu-west-1.amazonaws.com/static/press\\_release/2023/1725098181Worldwide-Cloud-Market-Q4-2022.pdf](https://canalys-prod-public.s3.eu-west-1.amazonaws.com/static/press_release/2023/1725098181Worldwide-Cloud-Market-Q4-2022.pdf)

- that a large share of revenues accrued in European Union by CSPs be reinvested in Europe (as it was done with microchips, to become as much as possible autonomous from foreigner suppliers).

## **2. AIIP remarks on a BEREC implied postulate underlying the relationships between ECS/N providers and CSPs**

With respect to the relationships between ECS / N providers on the one side and cloud and Edge service providers on the other, it seems that BEREC implies that UBB network is spread everywhere, ready to be used for/by CSPs.

Regrettably, in spite of the efforts made by EU with PNRR, this is by far away from being the truth.

It is thus necessary to further simulate the development of UBB competing network in the whole EU and to accelerate their roll-out.

## **3. AIIP answers to BEREC questions at page 6 of BEREC document BoR (24) 52**

At page 6 of BEREC document BoR (24) 52, BEREC clarifies that it is interested in receiving the stakeholder views on certain topics, which AIIP has grouped as follows.

**Q.1: With respect to migration from electronic communication networks to the cloud BEREC considers that “One of the preliminary considerations pointed out in this section [6.2] regards to the scalability constraints that face ECN that might hinder taking fully advantage of network cloudification benefits” and thus requests whether (and if so, to explain why) “mobile networks may face less limitations than fixed networks”.**

**In addition, BEREC requests whether there “Are ... other scalability constraints to be considered”.**

**A.1:** According to AIIP, the demand side characteristics of business markets favour migration from electronic communication networks to the cloud because cloud and edge services provide organizations with the ability to scale their computing resources and storage as needed and offer flexibility in terms of on-demand provisioning and the ability to quickly adapt to changing business requirements.

Moreover, as cloud services allow their users to transform fixed costs into variable costs (SAAS, IAAS, etc.), they reduce the need for organizations to invest heavily in physical infrastructure and hardware. By utilizing cloud resources, businesses can reduce their capital expenditures and instead pay for what they use on a subscription or consumption-based model. Edge services, on the other hand, enable processing and data storage closer to the source, reducing the need for extensive data transfer and potentially lowering costs

However, as clarified at par. 2 above, BEREC implies that UBB network is spread everywhere, ready to be used for/by CSPs, and -if FTTH- fully scalable.

Regrettably, in spite of the efforts made by EU with PNRR, it is thus necessary to further simulate the development of UBB FTTH competing network in the whole EU and to accelerate their roll-out.

**Q.2: BEREC requests then whether there is “a risk that investments in cloud-based networks crowd out private investments in network coverage and network capillarity”?**

**A.2:** AIIP has understood the first question at page 6 as follows: *"is there the risk that further to the diffusion of virtualized network, SDN or NFV, European ECS/N may no longer have resources for investing?"*.

According to AIIP there is a serious concern about the future for EU ECS/N as there is a serious risk of monopolization of electronic communications by virtualized networks carried and managed by US hyperscalers.

As a matter of fact, ECS/N operators have a great relevance in granting the necessary infrastructures for the provision of edge services (which are the more integrated into cloud ones as AWS), because of their network capillarity.

However, US hyperscalers have strong market power on the demand side and will negotiate strongly for purchasing at the lowest possible rates telecom services/infrastructures also to provide IAAS and NAAS to the public and become competitors to telcos, by squeezing telcos and foreclosing them to achieve the necessary profits to substantially invest in FTTH.

This will likely render necessary to increase State Aid interventions by EU member States which, at the end, will increase cloud/edge providers profits originated in EU (which will then be brought overseas to US...).

Therefore, in spite of the fact that in the short run we might assist to a cooperative kind of relationship between "Telcos" and "Hyperscalers", of the type "supplier - customer", in the medium run and, especially, in the long run it is very likely that we will assist to a more competitive relationship with EU Telcos losing the match, especially if no effective regulatory intervention is taken by EU.

As a matter of fact, nowadays we are assisting to a long term phase of margin squeeze suffered by EU physical network operators, competing for providing access to final users, while the revenue flows move from EU final access users to US hyperscalers.

Therefore, there is a serious risk that ECS/N have no longer resources for maintenance of their networks in the long run one may expect that that hypers will take over ECS/N in order to guarantee the continuous maintenance of the access network which is necessary for providing cloud and computing services to the final user.

According to AIIP it is necessary to define a new model so that the operators which are in a lower level of the networks, i.e. at the physical layer, duly remunerated by the operators which are in the lower logical level of the network.

As a matter of fact nowadays we are assisting the two flow of resources from the lower physical level of the network (ECS/N) to the higher logical level of the network (Hyperscalers and OTT) such as it happened in the convergence between fixed mobile networks and services where we assisted to the mobile network financed by fixed network operators through the so-called "calling party pays" principle and the very high termination rates paid from fixed networks to mobile network operators.

Another similar example, from the past, of flow of revenues which was not rational nor usual can be found in the "call back", where at a certain point the international calls were rerouted as originated from US (at US rates rather than international rates) and the call flows was from US → rest of the world and there was consequently, an enormous flows of money (one-way only) from United States to the other

countries thus depriving US operators from recovering the necessary resources to invest in expanding, maintaining and updating the networks.

**Q.3: Are investments in network innovation and network coverage substitutes or complements?**

**A.3:** Investments in network innovation and network coverage are clearly complements: as a matter of fact, while innovation is market driven in the most competitive (and profitable) areas, network coverage in less favoured areas, subject to digital divide, request an external intervention (such as universal service obligations).

Investment in (new technology) network coverage (also through public intervention and State aid) is absolutely complementary in order to spread innovation in all areas.

**Q.4: What are your expectations on the evolution of competition in the electronic communication markets given network cloudification?**

**A.4:** The result of this market structure and its concentrative dynamics is a clear trend towards monopolization by US hyperscalers and, in the absence of any regulatory intervention on cloud and edge computing services, a serious risk of market exit for European ECS/N providers due to convergence between ECS/N and cloud in the edge services, and a very likely takeover of the main European ECN/S by US hyperscalers.

As a matter of fact, convergence between ECN/S and cloud and edge computing is (and the more will be) happening only in a one-way direction in favour of US hyperscalers and cloudification effectively means that the market will very likely become virtualized and fully controlled by (US) hyperscalers for the following reasons which descend from the above market structure itself.

Nowadays IT services integrated with telecom solutions are offered by cloud providers to final users through partnerships with Telcos and/or ISV but in the long/medium run they will, likely, be achieved through acquisition of Telcos.

If a proper economic analysis was carried out then, rather than say that ECN/S part of the broad range of services that are evolving thanks to cloudification (executive summary p.3), BEREC should have considered: (i) the risks that such "one-way convergence" would bring to the monopolisation (or oligopolization) of the ECN/S by (US) hyperscalers and (ii) that any facilitation of development of cloud and edge services in EU should be preceded by the adoption of specific pro-competitive measures as far as ECN/S and other EU CSPs are concerned.

Without any timely and effective intervention in disregard the final result would not be that "*hyperscalers are expected to continue holding a central position*" (executive summary p. 5) but rather that "*hyperscalers are expected to be strengthening their oligopolistic position*".

**Q.5: Can market failures in the cloud market affect competition and investment in the provision of electronic communication networks and services? To which extent?**

**A.5:** Yes, of course, and severely. As above explained, and as it will be better clarified hereafter, in the absence of proper regulatory interventions (aimed at granting publications of API as well as of all information necessary to interoperate with hyperscalers and possibly with CSPs in general, together

with a general obligation to provide access and interconnection between different systems and platforms -e.g. ECN and cloud-) due to the concentrative dynamics of the market, market failures in the Cloud markets may affect competition and investment in the provision of electronic communication networks and services

BTW, the absence of adequate regulatory intervention on the largest CSPs/hyperscalers in the medium run would also affect the sustainability of the business of EU CSPs

**Q.6: Are all operators and service providers equally equipped to take advantage of network 'cloudification'? What would be needed to ensure that the transition to cloud networks does not create an uneven playing field in electronic communication markets?**

**A.6** At the time being there is a clear uneven playing field which, in the convergency between ECN/S and Cloud Services, disfavours ECN/S.

As a matter of fact, only the latter have specific access, interoperability and interconnection as well as transparency and cost orientation obligations.

On the other side, no *ex ante* regulatory obligation is vested upon hyperscalers, in spite of the structure and concentrative dynamic of cloud services market.

There is a clear (and unfair) asymmetry that should be overcome as soon as possible, before any permanent and unrecoverable market distortion takes place, not necessarily due to hyperscalers market conduct, which would fall under the antitrust prohibitions, but due to concentrative market dynamics of cloud services.

This asymmetry has to be overcome by regulating cloud and edge computing services by ensuring full interoperability, access and possibly standardization or transparency and publication obligations of APIs as well as of any other necessary information to interoperate with hyperscalers platforms.

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With respect to BEREC questions relating to paragraph 7 (relating to regulatory considerations as far as cloud and ECN/S convergence, synergies and dependencies among players and technologies, etc.), AIIP agrees in principle with BEREC; here follow AIIP answers.

**Q.7: "Do you agree that those are potential relevant regulatory matters in the coming years? Is there any other potential risk (or opportunities) that regulators should consider?"**

**A.7:** As far as AIIP stresses to BEREC the need to consider the above referred threat to a competitive market of electronic communications and networks (irrespective whether physical or virtualized) caused by the market dynamics of cloud and edge computing.

For this reasons AIIP requests an urgent regulatory intervention to by ensure full interoperability, access and possibly standardization or transparency and publication obligations of APIs as well as of any other necessary information to interoperate with hyperscalers platforms.

**Q.8: "What is your opinion on the different hypothetical situations mentioned in Chapter 7.2.2, point vi. "APIs openness and APIs exposure" in which potential issues related to API exposure may arise? Are these hypothetical situations relevant and if so, in what timeframe?"**

**A.8:** AIIP stresses the need that all information as to API be made available, at least by hyperscalers, to all the interested applicants operating in the ECN/S and/or cloud or edge services.

As a matter of fact, as BEREC has evidenced, without adequate transparency obligations on hyperscalers as to API and other information necessary to interoperate with their platforms there is a real risk that there will be more virtual access networks not interoperable between themselves as islands not linked to each other.

**Q. 9: “From a forward-looking perspective, is there a risk that network capabilities enabled by cloudification, in the context of the observed digital market trends (ecosystems, concentration, network effects, potential for leveraging market power into adjacent markets, etc), could lead to a reconfiguration of the Internet towards separated, proprietary and non-interoperable, environments?”**

**A.9:** Due to the market structure and concentrative dynamics, AIIP believes that without any regulatory interventions aimed at least at ensuring adequate transparency obligations on hyperscalers as to API and other information necessary to interoperate with their platforms we will necessarily assist to the implosion of open Internet, as of nowadays, and to its reconfiguration towards separated, proprietary and non-interoperable, environments, such as islands not linked each other.

In the event of lack of API openness there is a serious risk that the network neutrality principle be blurred by the lack of interoperability between different club/edge platforms.

As BEREC has correctly pointed out at pages 56-58 and 60 (“insufficient interoperability and standardization between cloud-based network solutions create operator lock-in with cloud vendors and hinder the adoption of efficient investments and preferred alternatives”).

In this regard, according to AIIP; the effective implementation of DMA and DA and the provision of interoperability and transparency obligations might help to prevent a “winner takes it all” scenario, only on the condition that full effect and timely and effective enforcement is given to their provisions.

Standardization is (one of) the right answer(s) to markets featured by concentrative dynamic due to network effects which, in the absence of standardization or adequate regulatory interventions, would result into a “winner takes all”.

However, standardization is a market driven activity which is unlikely to succeed where there are large differences between competitors and the different positions on the market requests, such as hyperscalers in cloud services market, as there is few (if not at all) interest in reducing the barriers to market entry or to supplier substitution and rendering such market more competitive.

AIIP knows that there are serious attempts to achieve standardisation in in cloud services market such as the projects named “*Gaia-X*” and “*Silver Cloud Project*” in order to jointly elaborate technical *standards* to be shared with all market players that for such aims some technical tables have already begun, to which all *hyperscalers* have requested to participate.

However, AIIP has crystal clear that standards are of a voluntary nature and may not be imposed to the market players and that, in order to be enacted, a very long time is necessary. This is even more true now, since at the technical table also seat *hypersaler* representatives (in this respect it is easy to recall the technical table on data portability under art. 20 GDPR, narcotized by Google and Apple). Certainly



such table will not go far away no proceed fast, as *hyperscaler* use proprietary protocols and do not have interest into standards (which would become effective only if of general use on the market).

In addition to the above need to standardization and opening/publishing of APIs features, according to AIIP, in order to open the CSPs market to competition, the EU should prevent any practice by hyperscalers aimed at acquiring and fidelizing customers thanks to the strong lock-in effects.

In this regard, AIIP believes that it is necessary to limit the recourse to so-called “cloud credits” offered by hyperscalers CSPs to their customers.

It is noteworthy that France has recently implemented regulations on commercial vouchers for cloud services, which are specifically designed to attract startups and keep them with free features and functions that could become a financial burden.

It is well-known that AI developers, who lack their own infrastructure and data centers, typically use CSPs for data processing, but very soon they find themselves trapped in multi-year contracts that increase technological dependence on foreign providers (who, BTW are currently dominating the global cloud and A.I. markets and are thus pushed to adopt discriminatory and/or exclusionary practices towards competing CSPs or AI developers).

Specifically, the use of “cloud vouchers” offered by US hyperscalers in order to attract European small and medium-sized enterprises (SMEs), together with the lock-in effect, can limit the latter switching capacity to other CSPs and make them even more dependent form hyperscalers and vulnerable to changes in prices or service conditions from hyperscalers, thus also limiting SMEs’ ability to innovate and develop their own AI applications.

Therefore, in addition to a maximum level of free credit that can be granted, we should follow the French example and impose a maximum time limit of one year for the issuance of any cloud credits<sup>7</sup>.

A local CSP cannot afford to offer hundreds of thousands of euros (or dollars) in free cloud services to be discounted on invoices, making them appear more expensive initially compared to those offering free credits to capture users.

This issue has prompted specific focus by the Antitrust Authorities in the United States, France, and the United Kingdom.

According to AIIP Berc should also consider introducing a limit for the amount of “cloud credits” that can be offered by cloud computing service providers to customers. These vouchers, while theoretically aiding startups, are typically used by hyperscalers CSPs to crush competition with other cloud service providers and, more importantly, create technological dependence for customers, which is bound by de facto exclusive relationships due to the well known lock-in effect.

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<sup>7</sup> These credits should also be subject to taxation because the fact that a portion of the compensation received for the service has not been physically paid by the end user but has been made available through a voucher is irrelevant for determining the tax base of the service provider.

#### 4. AIIP Final Remarks

BEREC has stressed the need to guarantee the European Union Digital Sovereignty as to cloud and edge computing (pag. 6, 48). However, BEREC has not proposed any measure in order to achieve such an aim and to protect European cloud service providers from the foreseeable strengthening of hyperscalers market power and the consequence of losing control over European data and European assets/richness as data flow and... will be controlled by US hyperscalers.

In this regard AIIP proposes that a large share of revenues accrued in European Union by cloud service providers (irrespective of their effective nationality) be reinvested in Europe. In this respect AIIP points out that the policy to be followed should be similar to that already followed with respect to microchips, where the EU held pivotal that Europe had to be as much as possible autonomous from foreigner suppliers.

Namely, the European Union must ensure that such revenues are reinvested in European (Cloud) Service Providers within a clear regulatory framework aimed at ensuring interoperability, equal opportunities, and the protection of investments in local physical infrastructures.

This is necessary to guarantee European Digital Autonomy and the safeguarding of the digital economy characterized by European local operators

AIIP suggests that EU defines a share of these revenues to be used to grant vouchers to EU start-up active in developing Artificial Intelligence so that they can spend such vouchers with EU CSPs.

In such a way the EU would also have a more clear outlook of the start-up active on AI and might define better support policies.

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Should you need any clarification on the above contribution, please do not hesitate to contact us at [cloud@aip.it](mailto:cloud@aip.it).

Kindest regards

Giovanni Zorzoni,

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