



COMPETITIVE BOTTLENECKS IN THE GENERATIVE AI VALUE CHAIN

A STARTUP AND INVESTOR PERSPECTIVE

March 11th, 2024

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Executive summary

Over the past five years, digital markets have been in turmoil. New technologies and applications have opened tremendous opportunities for businesses and consumers but also led to the emergence of new barriers to fair competition. Faced with practices that challenged the effectiveness of traditional antitrust enforcement, the European Union (EU) adopted the Digital Markets Act (DMA), the world's first rulebook to prevent anticompetitive practices online. Now, **the mainstreaming of generative artificial intelligence (gen AI) raises the question as to the relevance of existing instruments in addressing competitive bottlenecks in emerging, high-tech markets.**

Gen AI ended in the hands of the average user almost overnight when OpenAI released its ChatGPT chatbot for free in late 2022. The massive adoption of the app immediately raised fundamental questions: How will society use this technology? What impact will it have on people and the environment? And how will businesses extract value from this innovation?

2023 saw an almost uninterrupted sequence of unprecedented business announcements: record company valuations, strategic partnerships, massive investments into new companies...Most of these announcements came from well-established, dominant US-based technology companies. In this context, **will incumbents capture all the value in the emerging generative AI market or is there room for new competitors to emerge?**

This will depend on several factors: the barriers to entry for new companies, the potential abuse of dominant position by the incumbents but also the degree of dependence of new entrants from incumbents for strategic inputs and infrastructure. Ultimately, **is a fully European generative AI supply chain possible?**

To answer these questions, we turned to our members, European startups, and venture capital funds, to get their feelings from the ground. We also decided to look beyond the most popular companies and services to have a more comprehensive **overview of what is going on along the whole gen AI supply chain.**

Here are our **main findings**:

- The gen AI supply chain is long and complex and features both hardware and software components. **Each layer — and sublayer— of the supply chain is a market on its own but is also interconnected to the next, making interdependencies among companies strong.**
- The four main components of the gen AI supply chain are **chips** (design software, raw materials, high-precision machinery, manufacturing), **infrastructure** (chips, data centers, networks, software, and services, including distribution services), **foundation models** (open source, open weights, closed source or proprietary) and **applications**.
- While there is a lot of hype around gen AI foundation models, **the majority of the economic value is currently concentrated in chips and infrastructure.** It is also expected that significant value will also come from **specialized applications (such as health, finance, etc.)** addressing concrete enterprise and consumer use cases.

- **Vertically integrated companies (such as Amazon, Google, Microsoft, and, to a certain extent, Nvidia) are the best placed to capture value** all along the value chain; all established players are venturing into new markets to secure their presence at each stage of the supply chain, either directly or indirectly via strategic partnerships and investments, while also securing their presence both in the consumer and enterprise market.
- **Partnerships are becoming the primary way of doing business in the gen AI market**, both between small and large companies but also between large companies, often leading to a dynamic of cooperation (cooperation between competitors).
- While **no overtly abusive market practice has been recorded so far**, the dominant and vertically integrated position of certain companies entails **several risks** (which are detailed in this report).
- Established companies are not only important infrastructure providers for startups but also valuable **entry points to new clients**.
- **European companies excel in highly specialized applications and chips and infrastructure niches** of the supply chain; they are also challenging US actors in the foundation models market.

Based on these, **France Digitale believes that:**

- **The devil is in the details:** anticompetitive behavior will likely result from the accumulation of market practices that, taken alone, could be seen as legitimate, but that become anticompetitive when systematically applied by companies abusing their dominant position and/or the economic dependence of players downstream.
- As a result, **antitrust can't be the only answer to the competitive bottlenecks in the gen AI value chain**: preventive measures like those of the DMA should also be adopted.
- **Open weights and open source** models currently provide valuable alternatives to proprietary gen AI-related models, thus preventing technical lock-in and favoring the takeup of generative AI in existing companies. However, **open source models and software alone are insufficient to address competitive issues in the generative AI supply chain**. Open source is dependent on the technical contributions and the monetary donations of the developer community and of sponsors, which in turn raises questions as to their long-term technical and financial sustainability.
- Any action by authorities should be preceded by a **careful assessment of its side effects on European companies downstream** (startups) and **upstream**, (investors). This assessment should include, among others, considerations on interdependence, cost structures, and compatibility with quick innovation cycles.
- Authorities should not only focus on prohibiting certain practices but also proactively enact **policies, investment, and communication strategies that favor the emergence of strong European alternatives in all layers of the supply chain** to compete with dominant American and Asian companies.

Overview of the gen AI supply chain

