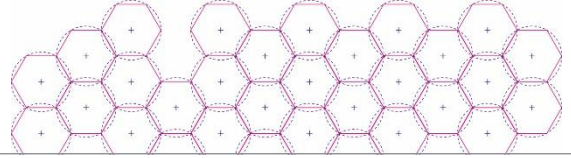# Implications of open source in GenAI

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Open source practices in Gen AI are reshaping economies, and influencing competition, societal and political dynamics. Plum Consulting's paper examines the dual nature of these practices, highlighting opportunities alongside challenges for policymakers and companies on that matter.

Introduction: The rise of open source in GenAI

AI has rapidly emerged as a transformative force across industries and societies, with generative AI (GenAI) currently at the forefront of this revolution. GenAI models (capable of creating text, images, code, etc.) are reshaping the boundaries of creativity, productivity, and decision-making. These advancements, however, unfold within a complex landscape where companies and governments strive to balance the acceleration of innovation with the implementation of regulatory frameworks to ensure ethical and sustainable development.

One of the most disruptive trends in GenAI is the rise of open source initiatives. Organizations such as Hugging Face[i], Stability AI[ii], and Meta[iii] are democratizing access to powerful AI tools by releasing open source models and platforms. This trend has catalysed significant changes offering new opportunities while raising concerns about economic concentration, fair competition, social equity, and political influence. This paper gives an overview of how open source practices in generative AI impact the economy, competition, society, and politics, highlighting both opportunities for innovation and the challenges they pose for policymakers, businesses, and civil society.

Artificial Intelligence (AI) and Generative AI (GenAI)

Generative AI is a subset of **AI,** specifically designed to generate new content, such as text, images, audio, or video, rather than just analysing or categorizing existing data.

AI applications include image recognition, fraud detection, voice assistants, and recommendation systems; e.g., Netflix recommending shows based on viewing history (predictive AI); Siri understanding commands and retrieving information (reactive AI).

GenAI applications include chatbots (e.g., ChatGPT), image generation (e.g., DALL-E), and deepfake creation; e.g., ChatGPT writing an original short story based on a prompt, Stable Diffusion creating a new digital artwork based on textual input.

Economic considerations for large tech businesses

The use of open source generative AI obviously presents strategic opportunities for large tech businesses because it proves to be a powerful tool to drive the **adoption of their own technical ecosystems**. By releasing AI models as open source, companies can attract third parties like businesses and academics in integrating them into their platforms. This creates a self-reinforcing cycle where widespread usage facilitates their adoption. An example of that is the Meta's release of Llama (open source language model) which contributes to strengthen the *PyTorch*[iv] ecosystem. Llama users are likely to adopt *PyTorch* for related tasks, which keeps them reliant on Meta's technology stack.

Another benefit of open source for large tech businesses, is that it enables them to contribute to **shaping industry standards**, which can give them a significant competitive advantage. By becoming the *de facto* standard in specific areas, these applications can ensure widespread compatibility with their company's wider platforms. When Tesla opened its electric vehicle patents, it established a collaborative model in the electric vehicle (EV) industry, indirectly reinforcing its leadership in EV infrastructure. In AI, this is what OpenAI did with *Gym*, a reinforcement learning API.

Finally, large businesses can benefit from open source by **monetising adjacent services**. Whilst open source models are typically offered for free, some businesses capitalize on the surrounding infrastructure or services that are needed to deploy, customize, and scale these models. Cloud computing platforms such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud reap significant revenue from the fact that other companies require their hosting, computing power, and storage to train and run these models.[v]

Besides benefits, open source generative AI can create some risks for large businesses. Open source generative AI may introduce potential **security vulnerabilities**, including data leakage or malicious code generation.[vi] Modified versions (also called "forks") could be repurposed for unethical or harmful applications, creating **reputational and legal challenges** for the original creators. The **dilution of their competitive advantage** is another potential risk for large businesses, as competitors

(smaller companies and startups) can use, adapt, and improve these tools to create competing products.

Diverging philosophies among industry leaders

The approach to open source AI varies significantly among large businesses, reflecting strategic differences:

Open source: Meta emphasizes openness[vii], releasing models like Llama under permissive licenses to drive adoption of its ecosystem and contribute to democratizing AI. IBM and Red Hat have launched in 2024 InstructLab, an open source LLM project, and have advocated "for the future of GenAI being open.[viii]

Proprietary systems: Companies like Microsoft (through OpenAI partnerships) and Google, favour a more controlled approach, focusing on proprietary systems integrated into their cloud offerings, such as Azure and Google Cloud. While they support certain open source initiatives, they rely heavily on monetizing closed, high-performance solutions.

These differences highlight a strategic and philosophical divide between companies.

Economic considerations for smaller businesses

Open source GenAI presents a transformative opportunity for smaller businesses:

Accessibility and reduced costs. Open source GenAI dramatically lowers the barriers to entry for small companies, allowing them to leverage (and customise) state-of-the-art AI models and frameworks without incurring significant costs associated with proprietary solutions.

Fostering innovation and enhance competitiveness. By integrating open source AI, companies can benefit from improvements made by the global developer community, accessing regular updates and enhancements without additional costs. They can finetune open source models to target specific customer bases and offer personalized services or localized solutions, as well as reduce their time to market. This may enable them to compete with larger firms.

As for large companies, risks include increased rivalry leading to **competitive pressure**, as well as **security concerns** related to data breaches for instance. Also, although open source tools are free, the **cost of deploying and maintaining** them can be significant (investment in computing power to finetune models, cost to hire or train experts). **Dependence** on external ecosystems is another risk for smaller companies. For example, updates and compatibility issues, as well as alteration of an

existing open source project may lead to **operational disruptions** for the user company.

Market competition considerations

Open source AI can facilitate market competition because it **lowers barriers to market entry**. Because it provides foundational technologies for free or at minimal cost, open source AI enables small firms and startups, which typically lack the resources to build proprietary AI from scratch, to enter the market using these assets (computing power, data and other inputs) without having to make huge investments. Another interesting mechanism is the fact that open source AI contributes to **limit redundant development efforts**: Instead of multiple firms independently solving the same fundamental problems, resources can be allocated to unique, value-adding innovations. Open source AI can also foster **knowledge spillovers**: advances in one domain can be adapted and applied to another, which enhances overall industry productivity and competition.

Nevertheless, there are also competition risks which should be monitored and, if needed, mitigated. While open source AI lowers entry barriers, large market players often have superior resources to customize, scale, and integrate these tools. This amplifies their existing advantages in infrastructure, talent, and datasets. Existing ownership of computing power and data advantage, as well as the concentration of existing ecosystems (and their large number of users) play a gravitational role in **accelerating centralization** of R&D and sale around a few large players. Another risk is the potential **erosion of proprietary competitive advantage**: when technologies are open and freely available, firms might hesitate to invest in costly R&D that would lead to minimal competitive differentiation, which can reduce innovation.

Socioeconomic considerations

If one looks at the implications of open source in GenAI from a socioeconomic angle, the following benefits and challenges might be considered:

Inclusion and access. Open source GenAI tools and datasets provide unprecedented access and related opportunities to advanced technologies for (under-resourced) researchers, academia, and small organizations.

Sovereignty empowerment. By extension, open source GenAI allows governments to develop their own solutions without having to rely on technologies coming from leader countries in AI like the USA or China.

Adaptability to local contexts. Open source models also allow customization to local languages, needs and values. Local businesses and communities can fine-tune these models to align

with their unique contexts and priorities, which is particularly vital for fostering inclusivity in AI development.[ix]

Possible misuse. Despite its benefits, the open nature of these tools introduces risks. For example, open source models can be forked[x] and forks may deviate from legal or ethical standards. For instance, modified models could amplify misinformation, a bias, or harmful content.

Standardization challenge. Too many open source options could slow down or even hinder standardization and hinder progress in establishing consistent norms for responsible AI usage.

Conclusion

In a rapidly evolving landscape, open source in GenAI represents a powerful driver of innovation and competition. However, as its definition and principles continue to spark debate, important questions arise:

- How can businesses effectively navigate the trade-offs between the benefits of inclusion, customization, and cost savings on one hand, and the challenges of security risks and lack of standardization, on the other?

- What steps can one take to ensure that innovation is sustained while preventing market consolidation that could create entry barriers and stifle competition?

- Are the policies around accountability and adherence to global ethical standards sufficiently clear and enforceable?

Exploring these questions is essential for shaping a future where open source GenAI can truly deliver on its potential.

About Plum

We are a leading independent consulting firm, focused on the telecommunications, media, technology, and adjacent sectors.

Plum has a significant experience advising global players in the digital sector, industry associations and regulators. We offer rigorous analysis to address challenges and opportunities across strategy, policy, technology and regulatory domains.

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[i] https://huggingface.co/

[ii] https://stability.ai/

[iii] https://ai.meta.com/resources/

[iv] https://pytorch.org/

[v] https://aimagazine.com/articles/how-ai-surged-google-clouds-revenue-growth

[vi] Some market players yet see open source AI as « an antidote, not a poison » when it comes to safety and security. ('Joint statement on AI safety and openness', Mozilla, Oct31 2023)

[vii] There is some debate though, on the extent to which Meta's open source AI is really open. Openness assessment of GenAI is considered as being tricky and definition frameworks like the recent one of the Open Source Initiative will play an important role.

[viii] https://shorturl.at/ocxXK

[ix] https://tinyurl.com/t5c3pfen

[x] Forking refers to creating an independent copy of a project's codebase, allowing users to modify and develop it separately from the original. "Free and open source software is that which, by definition, may be forked from the original development team without prior permission, and without violating copyright law."