Open Network Economy Series

March 2025

Algorithmic Pluralism:
Towards Competitive & Innovative Information Ecosystems

FoTI - Future of Technology Institute

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Open Network Economy Series

This whitepaper is part of the first in a series on the Open Network Economy (ON Economy), an accelerating shift in the way in which the web works that is characterized by a number of novel behaviors and technologies. We believe this paradigm change is reshaping the economics of the internet - from social media to search, and beyond.

In this instalment, we look at algorithmic pluralism in the information ecosystem. We introduce the concept and its importance across social media, traditional search and AI search. We then go in more depth on how social media works today and how algorithmic pluralism leads to a more diverse and innovative social web.

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This paper represents the opinions of the principal authors and of Future of Technology Institute, it may not fully represent the opinions of contributors.

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What is the **Open Network Economy?**

The **Open Network Economy** (On Economy) is the emerging paradigm of platforms, applications and products characterized by decentralization and interoperability, which enable users to curate and choose how they experience and interact with the web.

The On Economy is today most visible in its disruption of legacy social media - the centralized, top-down, platforms such as Facebook and X. These platforms, today nearly two decades old, are being challenged by new entrants like Bluesky, a social web platform built on modern decentralized principles and an open protocol. The difference between legacy social media and ON Economy platforms and products could not be starker.

Whereas the old social media relied on locking users in, making it impossible to leave a platform without losing their accumulated networks, in the ON Economy, users - whether individuals or businesses - have choice among a range of providers and can move between them without losing accumulated data and networks. In the old social media, users have very limited, if any choice, in the algorithms that feed them information; in the ON Economy, users have a plethora of choice and the ability to curate their own experiences.

Critically, because ON Economy platforms and products are built around interoperability and open protocols - with a sufficiently large market, monopolies and lock-in are virtually impossible, making the ON Economy the basis for an open and competitive market where innovation and new entrants can thrive. Legacy social media is known for having worked to capture the entire value chain to the point of turning social media into a no-fly zone for investors; in contrast, the ON Economy seeks to create long-term habitable ecosystems with a constant potential for innovation.

The emerging Open Network Economy can transform what is today a market benefitting only a few giant platforms into a vibrant, competitive market for European startups and for innovation and products that serve users and society. This is how policy-makers can support it:

1. **Incentivise** open protocols and interoperability via investment and tax breaks, focusing on European startups.
2. **Mandate** interoperability for social media platforms, expanding the DMA's existing messaging rules to social media.
3. **Unbundle** social graphs, ensuring users own their contact data—leveraging the EU's proposed Digital Fairness Act.
4. **Invest** in independent European infrastructure in cloud/computing to strengthen the Open Network Economy.

1 - Introduction

The internet is the primary medium through which billions of people access information, form opinions, and engage with the world. It's where businesses reach customers and get discovered, and where arts and culture develop. The internet is an integral and indispensable part of our modern global infrastructure.

Today, critical parts of this ecosystem are shaped and controlled by a small number of powerful incumbents and their proprietary algorithms. Search engines like Google, social media platforms like Facebook, Instagram, and TikTok, exert immense influence over what information is discovered, how it's presented and to whom. While these platforms provide convenience and efficiency, their centralization has given rise to significant challenges.

In traditional media, material has first to get sourced. In news, that may be by a reporter, in fiction or opinion publishing it could be via submissions or commissioned. Then that material needs to be filtered. Some of it may or may not be newsworthy or it may fail to meet some measure of originality. It may not align with a given editor's worldview. Note that what is filtered out isn't being censored: the author remains free to find other avenues, for instance to print it and send it to friends, even though that will limit their reach. Finally, the material that makes it past the filters must be ranked: some of it will be featured on the front page with a large headline or given pride of place in a collection, while the rest will be made less prominent.

Sourcing, filtering, ranking: those steps are no different from the processes applied by tech platforms. The truth is that, once we look past a number of implementation differences, the most significant elements that separate tech platforms from traditional media is that they have automated the sourcing, filtering, and ranking through algorithmic means.

How would we regulate newspapers if there were only one? Firstly, we would work to ensure that many new alternative ones can emerge, and keep emerging. Having access to only a tiny number of filtering and ranking processes has the same impact on society and on people's lives as having access to a handful of TV channels and newspapers — except less accountable because of the degree of personalization in social media and the fact that social media platforms are not held to the same obligations as publishers.

The availability of an open, diverse multiplicity of feeds is a trend that we see as part of the ON Economy. It is at the same time better for society, a competitive advantage (that Meta is already partially — but insufficiently — copying), and a new market in and of itself in which feed providers can compete with one another on open social paltforms.

The scope of algorithmic media

Before we detail solutions to concentration problems in algorithmic media, we need to understand what exactly falls within the scope of that term.

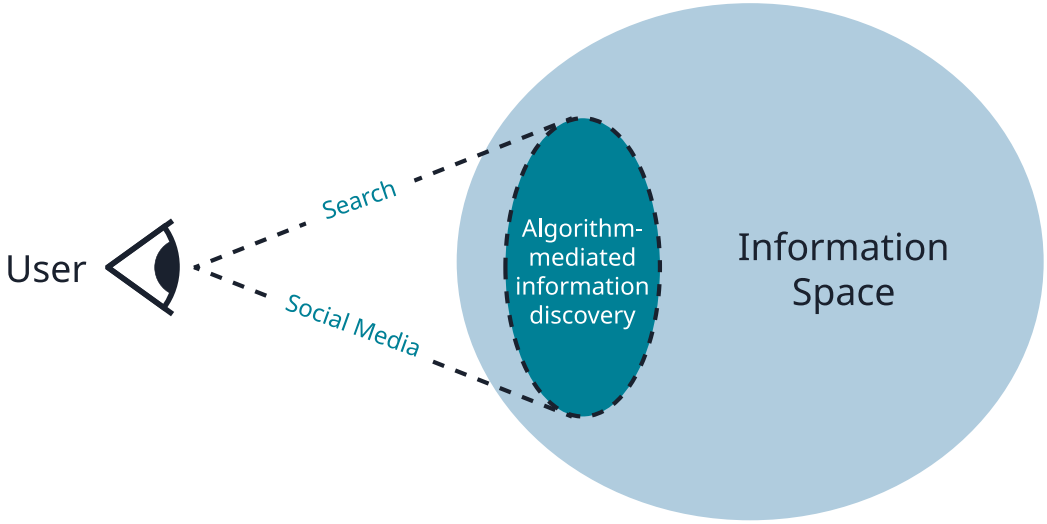
Note that while the focus of this series is on the social web, the part of algorithmic media most commonly overlooked is search, which is the base layer of personalization, and debatably a core tool in framing events and problem-spaces in consequential yet invisible ways. Altogether too often, search engines are surrounded with an air of neutrality, as if the output they produce were grounded in a real-world, scientifically proven notion of relevance. Nothing could be further from the truth. While social feeds are pushed to users and search results are pulled from the search engine, in both cases the content had to be sourced, filtered, and ranked. The interaction modality does not change the nature of the underlying process, and search results can be just as influential as more linear and obviously curated social feeds. Upon closer inspection, it's interesting to note that some algorithmic media (YouTube, for instance) are actually a blend of search and social approaches.

Search, like social media, is changing. Social platforms have long acted as partial search engines and now with the growth of AI-mediated search (via AI chatbots), there is major disruption underway.

We cover search in this paper as it is a relevant neighboring topic to social media, even if it is not traditionally considered part of the social web. We believe that the innovations emerging in the ON Economy will likely translate to search as well.

2- How information is accessed & discovered online

There are two main modalities for information access and discovery: search and social media. Search is effectively a Google monopoly and social media is an oligopoly with a few companies in control, particularly Meta (Facebook, Instagram, Threads), X, Google (Youtube) and Tiktok. A third important modality for information discovery is growing fast: AI search through chatbots like ChatGPT, Claude and Perplexity AI, among others. Whilst there is no current structural monopoly or oligopoly in AI search, there is significant future risk of this happening.



Today, the vast majority of information discovery is mediated by algorithms controlled by a handful of platforms. Users have very little, if any, control over the information they see.

The dominant search engine and social media platforms control what information is visible for their users through complex, proprietary algorithms. They source, filter, rank and finally present information to users, optimizing for engagement and time spent on the respective platforms - which translate into increased advertising revenue.

As recently shown by researchers from the psychology department at NYU, engagement-based algorithmic ranking produces a list of social harms that include promoting more extreme, negative, and divisive content, warping public perceptions of social norms towards greater out-group animosity.

The concentration of control over online information discovery in the hands of a few dominant platforms raises significant concerns for the health of the digital information ecosystem. By prioritizing engagement and advertising revenue, these platforms' algorithms shape not just what information users see, but also how they understand and interact with the world. The resulting social harms—such as the amplification of divisive and polarizing content—highlight the need for systemic change.

As AI-driven search grows as a modality for information discovery, there is both an opportunity and a risk: while AI search currently lacks the structural monopolies seen in traditional search and social media, its rapid growth could replicate similar patterns of concentrated power. Notably, with the rise of potential AI-driven search competitors, Google has rolled out AI overviews on Google Search, leveraging its existing market dominance and again favouring its AI-search.

To address these challenges, fostering algorithmic transparency, accountability, and pluralism is essential. Empowering users with greater control over the algorithms that mediate their information access can help create a more equitable, diverse, and healthier online information ecosystem. This must be coupled with mechanisms that protect publishers and original content creators, enabling them to control how their content is monetized.

The term algorithmic pluralism was popularised by France's Conseil National du Numérique following the publication of the final report of the États Généraux de L'Information, a national initiative by President Macron to examine changes to the information ecosystem. Algorithmic pluralism advocates for the coexistence of diverse algorithms within information and decision-making systems, ensuring that no single algorithm becomes the arbiter of relevance, severely restricting the information people are exposed to. The concept is particularly relevant in contexts like social media platforms, where algorithms influence content visibility and user engagement.

The concept of algorithmic pluralism grew from previous work on unbundling of the information ecosystem by thinkers ranging from legal scholars, to technologists and political scientists.

For example, a 2019 report led by Fiona Scott Morton identifies interoperability, unbundling content from platforms and non-discrimination as potential antitrust remedies to excessive market power. Maria Luisa Stasi 2023 paper titled "Social Media Markets: A Pro-Competitive Approach to Free Speech Challenges" investigates the interplay between competition law and freedom of expression in social media. It suggests that unbundling content hosting and moderation could address market failures and enhance media diversity.

In his 2021 essay "Making the Internet Safe for Democracy," Francis Fukuyama discusses the significant influence of major internet platforms in shaping political discourse, which poses challenges to democratic processes. He evaluates existing solutions like antitrust actions, government content regulation, data portability, and privacy laws, finding them insufficient. Fukuyama proposes an approach involving "middleware" companies that would handle content curation, thereby decentralizing control and promoting a more democratic information environment. Richard Riseman and Cory Doctorow are among various others that have written and spoken extensively on opening up social media and the advantages of interoperability.

3- Algorithmic pluralism in the Open Network Economy

A necessary requirement for algorithmic pluralism is distinguishing between the different technological layers of a given service, building on common technological infrastructure and opening up the consumer/ business facing layer to competition. In this paper, we will focus on social media as a case study for algorithmic pluralism.

Today's social media is characterized by the dominance of a handful of centralized platforms over the flow of information. Their algorithms—opaque and guided by the narrow commercial and political interests of the companies behind them—determine which content is prioritized or suppressed. The increasing societal polarization and threat to democracy that this poses is well studied, but there are broader consequences. The closed walled-gardens of the leading social media companies stifle innovation and severely limit user choice; they put many businesses - from online marketplaces to publishers to brick and mortar shops - at the mercy of the interests of a handful of companies.

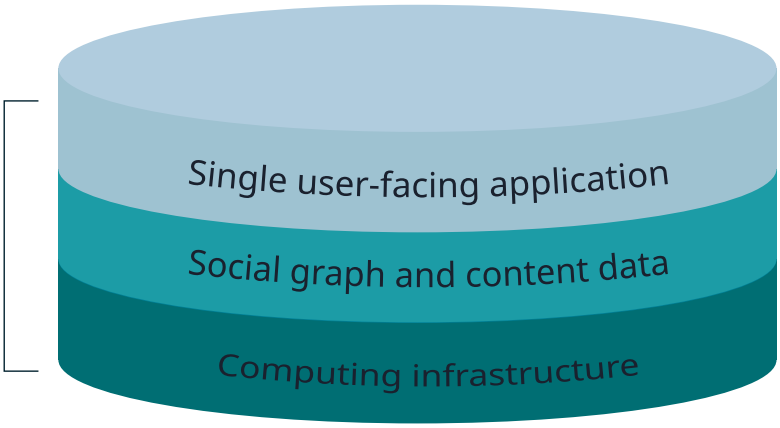
Algorithmic pluralism brings an open marketplace to social media and other essential services, where consumers and businesses have choice and new innovative services and market entrants have an opportunity to compete and succeed.

Algorithmic pluralism, when combined with **interoperability**—the ability for different platforms to work together seamlessly—is revolutionizing social media.

Social media incumbents

The social media market is today dominated by a very small number of companies. Social media services designated as Very Large Online Platforms (VLOPs) under the Digital Services Act (DSA) are: Facebook, Instagram, Linkedin, Snapchat, TikTok, X and YouTube. All have closed platforms, where connections between users, content, moderation and recommender systems are under the sole control of one company.

One company controls all the technology layers
e.g. Facebook, X



In today's social media, computing, social graph and content are owned by one company that provides a single user-facing product. Users have zero choice of recommender systems and content moderation algorithms. Their connections (the social graph) are tied to that one company - they can't leave the platform without losing them.

The problems with social media incumbents today are well documented: spam, fraud, addictive design, disinformation and amplification of harmful content (a particularly acute issue in some cases) among others. In a healthy competitive market, users would be able to change service providers and use a better-suited alternative. A competitive market benefits consumers and creates better products because bad products lose customers. This is not the case with the social media market that dominated the past fifteen years.

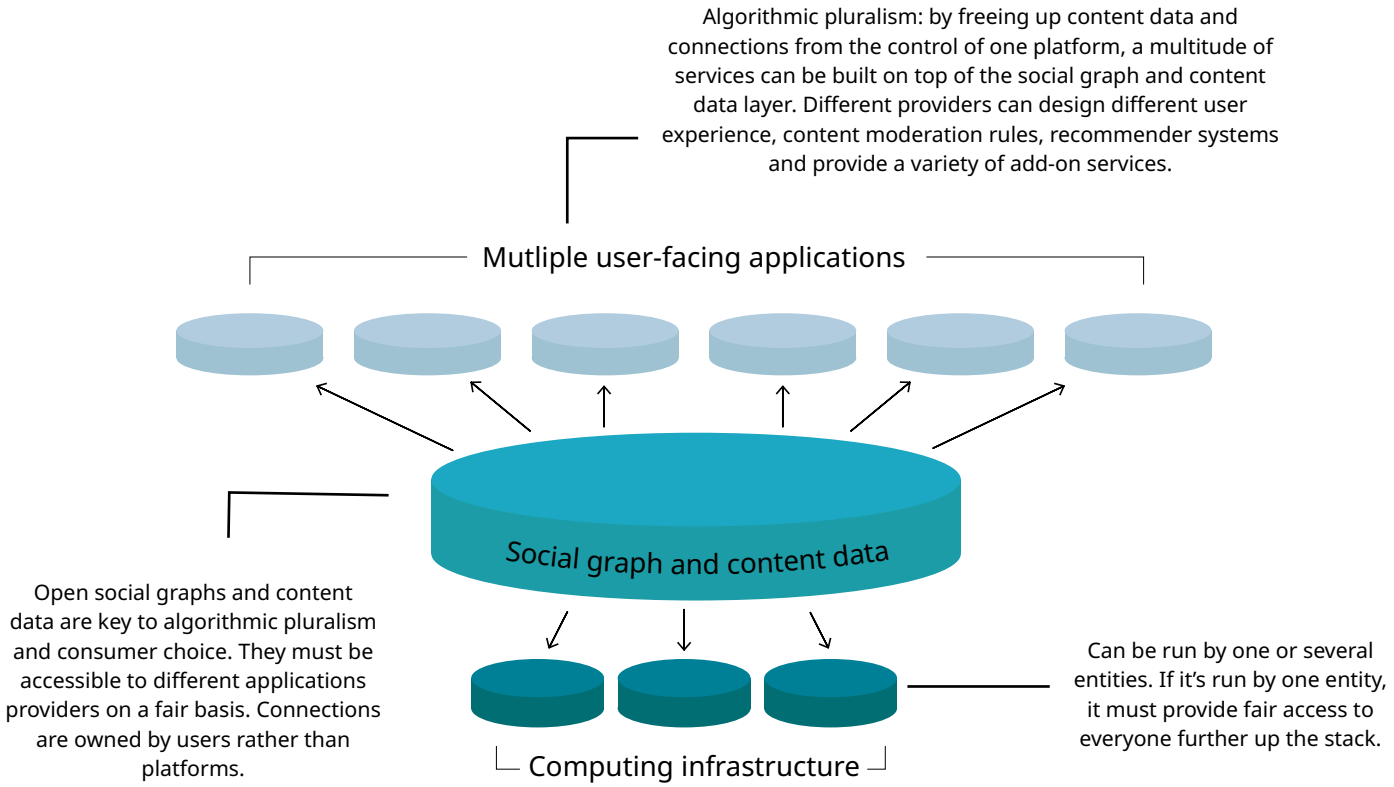
There is a very high barrier to leaving a social media platform as users do not own their connections to others on the platform, so if they think about e.g. leaving Facebook they would lose all their 'friends' and if they leave X, they would lose all their 'followers'. As such users have very little influence on the behaviour of the platforms; they are in effect trapped with no choice but to accept the way a platform decides to run itself or leave and lose all their connections and content. The overall impact is that irresponsible platform behaviour has very little consequence, because users cannot vote with their clicks.

The social media market is not a healthy one. It traps consumers, offers very little - if any - choice and creates huge barriers to new entrants. It's good only for the few existing dominant players.

The Alternative Is Here:
→ Open and Interoperable Social Web

Introducing algorithmic pluralism, together with interoperability, to social media platforms is revolutionizing the industry. In this emerging social web, the computing infrastructure, social graph and content data, as well user-facing applications are three distinct layers.

At the heart of this alternative vision is opening up the middle layer: the social graph and content data, to third party service providers. This means that different companies and service providers can provide different flavours of social networks for users. For example instead of only the choice of feed provided by Facebook, new social web startups could operate on top of the middle layer to provide users with different kinds of feeds: e.g. a 'positive vibes' feed, an ad-free feed, one without political content, a professional feed, an application integrating posts from friends with relevant educational material, etc... there's a world of possibilities. This is the essence of algorithmic pluralism.



In addition, new social web platforms are giving users the ability to design their own algorithms. This is something we are seeing today with Bluesky's AT Protocol, with companies such as Bluesky Feed Creator or Graze providing platforms for creating custom feeds.

And whilst designing algorithms has always required a significant degree of technical knowledge, this is now changing - technologists such as venture scientist Philippe Beaudoin have been developing solutions leveraging LLMs that enable anyone to create their own custom algorithms using natural language prompts. Such innovations pave the way for a much more democratic and user-centric future for the social web.
An additional critical element for this alternative vision for social media is interoperability. Interoperability enables different social media platforms to communicate and exchange data, allowing users to interact across networks without barriers. It also makes it easier for other technology and service providers to offer their services across social networks. Interoperability is achieved through common standards and protocols that ensure compatibility.

BENEFITS of the open and interoperable social web:

- **Diffuse market & political power** in social media can help create a balanced relationship between private companies, society and democracy
- **Enhanced Competition and Innovation:** Lowers entry barriers for new platforms and service providers, promoting diversity in the social media landscape. Open protocols mean that a wide variety of add-on services and experiences can be developed in ways that are impossible with traditional social media. By keeping the ecosystem open, we can prevent the emergence of "kill zones" that put an end to investment and innovation in a domain (as happened in social and search for over a decade).
- **Seamless User Experience:** Users can engage with content and people across different platforms without needing multiple accounts. Single apps that seamlessly integrate different social networks become possible, streamlining user experience.
- **Data Ownership and Portability:** Users maintain control over their social connections and their data. They can move between services without losing their social network or content.
- **Facilitating layer-specific regulations**: this would make regulation clearer and easier to enforce (e.g., "any moderation service must verify X, Y Z", "any personal data storage must be GDPR-compliant", "any recommendation algorithm must have a 'general interest' estimator"...)

Case Study:
→ Alternatives to X and Threads

There are a number of emerging offerings in the Open Network Economy. The most prominent of these are ActivityPub and ATProtocol.

Their best known applications are alternative microblogging services, particularly Mastodon/Fediverse (built on ActivityPub) and Bluesky (built on ATProtocol).

Common features of both platforms:

- Both platforms address concerns about centralised control and data ownership that plague traditional social media
- They aim to foster community-driven experiences and reduce the influence of attention-grabbing algorithms
- A key feature of both platforms is separating the different layers of the social web stack to offer users greater choice and control
- Decentralised moderation poses challenges, and both platforms are exploring different approaches to content moderation and user safety

Key Differences Between ATProtocol/Bluesky and ActivityPub/Mastodon

Whilst they share many features in common, ATProtocol and ActivityPub also differ significantly in their technical foundations and user experiences.

ActivityPub powers a federated ecosystem where independent servers, or instances, communicate with one another. This federation model allows users to interact across servers, forming a decentralized network known as the “fediverse.” The protocol emphasizes interoperability and a standardized approach to content exchange, which has enabled its adoption by platforms like PeerTube and Pixelfed alongside Mastodon.

ATProtocol is a newer protocol designed with flexibility and user autonomy in mind. A key feature is feed interoperability - any app built on the protocol could effortlessly include any interoperable feed generator. ATProtocol also focuses on decentralized identity, allowing users to move their accounts, followers, and data seamlessly between different hosts. This portability aims to address a common limitation of decentralized systems, where identity and data are often tied to specific servers. Additionally, ATProtocol introduces the concept of algorithmic choice, enabling users to select or customize the algorithms that determine their content feeds.

The AT Protocol architecture also considers whole-of-network components (such as indexing and search). Ignoring whole-of-network aspects is what caused the web to lose its decentralization: publishing to individual nodes remains decentralized, but finding content is almost entirely centralized around Google. This is sufficient to exert control over the network and is therefore an important aspect to take into consideration from the get-go.

The differences also extend to how the protocols handle moderation and governance. In ActivityPub's ecosystem, moderation is decentralized, with each server enforcing its own rules and policies. While this allows for diverse community standards, it can also lead to fragmentation when servers block or defederate from one another. Bluesky's approach, powered by ATProtocol, emphasizes modularity in moderation tools. It envisions a system where content labeling and filtering are composable, enabling users or third parties to apply their own moderation frameworks. By allowing users to control their exposure to certain content rather than relying solely on server-level decisions, AT Protocol seeks to provide a more tailored and user-centric experience.

Finally, whilst the AT Protocol is built for decentralization, it is - as of writing - highly concentrated within BlueSky, with no independent infrastructure for its core components. For AT Protocol to live up to its promise, it needs independently run infrastructure. This needs to be designed as a "backbone fallback", i.e. if something ever goes wrong with BlueSky (accidentally or maliciously), users could effortlessly carry on their use with barely perceivable interruption of service. Future of Technology Institute is a founding partner of Free Our Feeds, a non-profit initiative that aims to accomplish this.

Challenges and Tradeoffs

- **Moderation and community safety:** on traditional social media platforms, moderation and community safety are centralized, with policies applying uniformly across the network. In theory, this should provide consistency and predictability - however there are countless examples of the opposite being true.

  The Fediverse relies on server-level or community-driven moderation, which allows for diverse standards but can lead to inconsistent enforcement and conflicts between servers. Whilst Bluesky users can customize content filters (known as composable moderation), giving them more control over the content they see - it also has centralized moderation that applies to all content on the platform. If and when alternatives to Bluesky built on ATProtocol emerge, so will the same issue of inconsistent moderation become true.

- **Identity management:** traditional social media platforms centrally manage user identity and credentials. They can enable, suspend, ban and restore users.

  With both ATProtocol and ActivityPub, individual services (e.g. Bluesky or Mastodon) can control users across their specific network, but not across the whole protocol. This means that identity providers need to be governed separately to the social media service providers. To protect against fake accounts and spambots, adopting a privacy-preserving proof of personhood solutions is critical.

- **Privacy and feed generation:** ATProtocol feed generators see all posts to the network in order to operate, which can have consequences in terms of erasure rights and indexing preferences. Feeds also know who loads them and are therefore a potential tracking vector. Generally, developing and deploying best practices for privacy and the respect of data protection regulations in decentralized systems is challenging.

  Firehose: processing the ATProtocol firehose (the constant stream of posts) is already relatively intensive; it will become prohibitively expensive to perform as the network grows. Work is needed to ensure that it can be done efficiently at much lower cost so as to avoid creating a situation in which the cost influences who can make feeds.

- **Business models:** traditional social media relies on targeted advertising to generate revenue and profit. This has certainly been a successful model for many social media platforms but it comes at significant costs to privacy, public health and public discourse.

  The Fediverse is run on a combination of donations, and crowdfunding with most instances being non-profit. Bluesky is a for profit public benefit corporation - they have stated they do not want ads to be their dominant revenue source and the platform does not currently offer ads; Bluesky has launched their first paid service (custom domains). Whilst subscriptions, paid services and privacy-preserving advertising (e.g. contextual advertising) represent potential alternative business models, they are yet to be proven successful at sustaining a large social network.

4- Conclusion

Algorithmic pluralism, coupled with interoperability, is revolutionizing social media, introducing competition and choice in what is an essential service for businesses, consumers and the wider society. It opens up possibilities for startups and new market entrants by reducing barriers to entry and enabling competition with established platforms.

Such a decentralised ecosystem is encouraging experimentation and the development of new and innovative social media features and services. It enables businesses to offer specialised services tailored to specific communities and individuals, increasing engagement and value for both users and businesses. Critically it brings accountability to a market where there is currently very little incentive for companies to respond to consumer and societal needs and concerns.

The destructive effects of social media that are optimized for engagement and ads don't disappear in a world with algorithmic pluralism — presumably, engagement or outrage drivers can still exist in different variations — but in a world where consumers have real choice, social media networks will have to respond to market pressure, consumer demands and societal needs.

If we want to build a healthier public discourse, reduce polarization and reinvigorate our democracies, we need information systems that are capture-proof - including a social web that cannot be controlled by any one individual or company and that has to respond to societal needs, rather than manipulate them. For this to be possible, social media should be treated as communications infrastructure, which it is.

What does this mean in practice? Social media as communications infrastructure should be fully interoperable - much like mobile phone networks. Users own their identity, contacts and can take their numbers elsewhere. They can leave a network, choose any other service, and lose nothing. Their contacts don't even need to know it. Like mobile infrastructure, social media infrastructure will also need a level of public funding, at least at the start, to set up the foundation for a healthy, competitive social media market. This is the promise of the Open Network Economy.

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Future of Technology Institute

FOTI - Future of Technology Institute is an independent think-and-do tank. We are not aligned to any political party or movement and we do not take funding from tech companies.

We need competitive, open markets that encourage innovation, produce better products and give consumers real and feasible choices. Today's digital technology ecosystem fails to serve European consumers, businesses and democracy on multiple counts.

In a changing world, where the security of Europe is more at risk than it has been for decades, it is also critical that Europe builds a sovereign technology ecosystem that is not reliant on the decisions of foreign governments or CEOs, delivers prosperity for Europe, and is robust enough to protect our democracies.

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