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From Software to Society

Openness in a changing world

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OPEN KNOWLEDGE FOUNDATION DEUTSCHLAND

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Executive summary

This report examines the concept of Openness in the digital age, tracing its history, current state, and key challenges, particularly in the face of the rapid developments around Artificial Intelligence. It draws primarily from expert interviews and literature review. The Open Definition by the Open Knowledge Foundation, emphasizing free access, use, modification, and sharing, serves as a baseline to understand the concept. However, the report underlines the need for revision to address contemporary challenges.

While Openness has achieved mainstream success and is recognized as a significant driver of innovation and societal value, it currently faces considerable pressure. Key challenges include conflicting definitions and usage, market consolidation leading to power concentration, the growing entanglement of Openness in geopolitics, and internal issues within the Open movement, including a lack of a unified purpose as well as unforeseen consequences of practices.

The authors present three alternative scenarios to distill and contrast different approaches and priorities of Openness along the dimensions objective, focus, and intentionality: A continuation of the current status quo, a (re-)focus on technical and legal aspects, and a shift towards a new purpose-driven understanding. While all three scenarios present opportunities for the future of Openness, the authors argue for a stronger purpose-driven approach.

The paper provides recommendations for the way ahead, categorized into three areas. First, rethinking Openness: This involves contextualizing Openness to serve a purpose beyond itself, emphasizing participatory approaches, and considering power dynamics as well as potential harms. The authors share the analysis of many experts that Openness is still a relevant concept. However, it rather takes the shape of a guiding principle in the background rather than as a primary purpose. Openness is increasingly implied by or associated with other terms. It has largely lost its rallying power to activists and communities. Second, strengthening the foundations: This includes adding guard rails to open licenses to prevent misuse, investing in open innovation and infrastructure, building more compelling narratives, strengthening civil society, boosting digital literacy, and pushing for more Open government data. Third, addressing power and markets: This requires embracing the political dimension of Openness, taking action against monopolist structures and market domination through stronger antitrust regulation, possible taxation and a limitation of behavioral tracking.

In conclusion, the report calls for an active and intentional approach to reshape Openness with a clear purpose, such as strengthening public interest and democracy.

Introduction

Openness as a concept has been a fundamental driving force for the digital world. From the underlying software that is often developed as Open Source, to the protocols that move data across the internet, to the content that might well be licensed under free or Creative Commons licenses: The history of the internet — and by extension the world — we know today has been significantly shaped by the principles of Openness and the achievements of the Open movement. Openness has won, has it not?

Openness has become a core concept in larger debates around tech policy, digital and innovation policy. The term is simultaneously universally acclaimed and ubiquitous. Openness is part of the fabric of society, if often more or less invisible in the background. The United Nations' Global Digital Compact aims for an "inclusive, open, sustainable, fair, safe and secure digital future for all" (UN 2024: 1). The EU's AI Act recommends "General-purpose AI models released under free and open-source licences should be considered to ensure high levels of transparency and openness" (EU 2024: 27). Organizations like the Open Technology Fund, Open Society Foundations, Open Future and our own Open Knowledge Foundation carry the term in their name, as do companies like OpenAI or the UK's Open University. Listing these names it becomes obvious that "Open" means different things in different contexts.

Artificial Intelligence (AI) takes this challenge to a whole new level. Openness in the context of AI means revisiting the concept itself and its definitions: The creation of AI systems is inherently complex and not comparable to a source code: AI is usually not open for modification (Can it be open?).[1] AI technologies are widely considered crucial for economic development but also for geopolitical relevance (Should it be open?). However, there are also claims that the AI hype cycle will likely end soon when the underlying method will reach its limit and/or economic conditions change. Given the disproportionate collective attention that AI is having across society — from industry to policy, from platforms to politics —, this warrants a closer look both at Openness in the context of AI and at the state of Openness more widely.

In this paper we attempt to take stock of where we stand in terms of Openness and what challenges and opportunities we see emerging. We start with terminology and definitions since there is no agreed-upon definition of the term Openness. Each branch, like Open Source and Open Education, has its own terminology and specifics. We briefly go through the history of Openness, underlining the questions, hopes and values that have guided and shaped the movement to date, and point out major accomplishments of Openness. Then, we address the challenges that Openness is facing today. Despite all success it seems as if Openness is going through a midlife crisis. Based on three different scenarios for the future of Openness, we gathered some recommendations moving forward and staying relevant.

We undertake this research with a broad readership in mind, but work under the assumption that it will be most concretely useful to those whose work is touched directly by one or more facets of Openness: Those who might consider themselves part of the larger Open movement (as broadly as that might be defined), public interest technologists, policymakers who think about issues ranging from platform regulation to AI to public administration reform to public procurement, as well as funders and philanthropists who engage in issues around tech and society.

We have the privilege to build on a tremendous amount of work done by others. Besides the literature referenced throughout this document we would like to highlight

[1] The ‚open weights' approach, which means to share the final parameters of a trained AI model, allows for fine-tuning and quantization which may count as modification; see: https://opensource.org/ai/open-weights.

especially the experts who kindly offered their time for our research interviews (see the list of experts at the end of this document). We would like to pay special tribute to Open Future, who have accomplished significant work with their studies on Openness, including Paradox of Open (Keller and Tarkowski 2021), Fields of Open (Tarkowski et al. 2023) and Shifting Tides (Tarkowski et al. 2023), which served as a great inspiration and reference point for our investigation.

We hope this paper will be useful to get a fresh perspective on a powerful and historically important concept that has come under pressure — and that might require an update so that it can continue to contribute value in a radically changed political environment.

This paper was funded by Stiftung Mercator. We are very grateful for the foundation's trust to make a relevant contribution with this paper to an important issue for our digital future.

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Terminology and definitions

Our intention is to keep semantic discussions to a minimum in this document. That said, it is helpful to be aware of the definitional lay of the land. As far as definitions go, the most canonical definition of Openness[2] is the Open Definition (Open Knowledge Foundation 2005, revised in 2015).[3] It derives from the Free/Open Source software definition[4] and expands and applies the concept to data and content. It is widely referred to and accepted. It serves as the baseline we work from in our paper. The Open Knowledge Foundation summarizes Openness - in relation to data and content - as follows:

> ***"Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and Openness). Put most succinctly: Open data and content can be freely used, modified, and shared by anyone for any purpose."***
>
> Open Knowledge Foundation 2015

The Open Definition is an important point of reference worldwide. The definition is straightforward and simple, and probably this is part of its lasting success. The criteria for Openness are clearly structured and can be checked against a binary (yes or no). The criteria focus around format and licence of the information. The list of possible open formats and licences is also clearly defined. With the Open Definition everybody can check whether a data set or a content item like a blog is open or not. However, the definition is due for a revision since it does not address urgent questions: What is the vision behind more Openness? Why do we strive for it? How can we ensure diverse and inclusive participation? How can we protect the commons from corporate interests? What power structure do we want to change?

We need to go beyond the attributes format and licence in order to address these urgent questions. When asked for a definition, our interview partners answered with a huge variety of attributes that their personal concept of Openness includes.

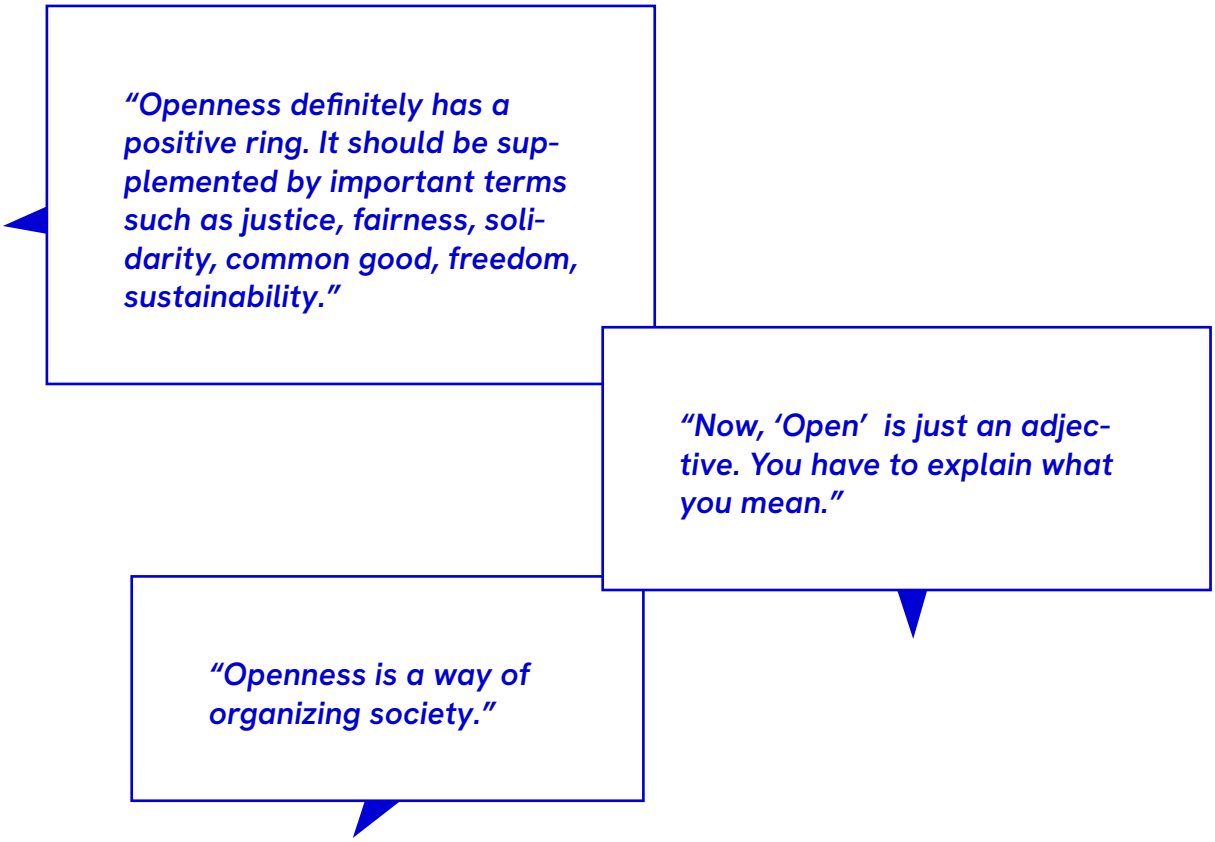
> ***"Openness includes licences, interoperability, and most of all thinking in terms of ecosystems."***

> ***"Openness means the ability to be creative and share content freely."***

[2] For better readability, throughout this document, we capitalize Open/Openness as a shorthand for the concept of Openness.

[3] The first *Open Definition* was released in 2005; we refer to version 2.1 from 2015.

[4] See Free Software Foundation's definition: "[...] users have the freedom to run, copy, distribute, study, change and improve the software" at www.gnu.org/philosophy/free-sw.en.html.



We believe that a revised definition needs to include phenomena ranging from technological aspects to political economy to governance models. One key challenge of the term Openness is that it refers to a broad range of aspects and is highly context-dependent. We use the term this broadly to be able to connect core ideas and concepts across different areas. Where we refer to more specific uses, they will be marked accordingly. Equally, when connecting to other areas that are traditionally less connected to this use of Open, these uses will be flagposted just as those uses we consider out of scope for this endeavor.

The four essential freedoms

Historically, for free and open source software, four freedoms are considered essential. The Free Software Foundations numbers the essential freedoms from 0 to 3: The freedom to run the program as you wish, for any purpose (freedom 0). The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this. The freedom to redistribute copies so you can help others (freedom 2). The freedom to distribute copies of your modified versions to others (freedom 3). Since these are frequently implied when Open Source or free software is discussed, it is important to keep this concept in mind going forward.

In the software world, there has been a long-running, intense and meaningful discourse around differences between Open Source Software, free software and libre software. For the purpose of this document and for ease of reading, unless noted otherwise, we singularly use the term Open.

Open XYZ

Openness as a concept is relevant for many contexts that are focused on one specific thematic field or product. They might share some ideas of Openness, but also have their own definitions and ecosystems. Most well known contexts are probably Open Access, Open Data and Open Source. Many of these terms date back to the early days of mainstream internet in the 2000s and 2010s. During that time, Openness was in the (metaphorical) air: If you could put the word "Open" in front of a noun, someone would. Here is an overview of some of the branches of Openness that were mentioned by our interviewees and in papers we referenced.

> *"Talking about Openness in general is too abstract."*

Chart 1: Branches of Openness in the context of digital technology

Open Access	research publication licensing/sharing practices
Open Culture / Open GLAM (Galleries, Archives, Libraries, Museums)	media/content licensing and production/sharing practices
Open Data	data licensing/sharing practices
Open Design	production practices/sharing of physical items with open licences
Open Education	teaching practices and material license/sharing practices (Open Educational Resources)
Open Government	transparent and accountable government, better explanation of premises and decisions, inclusion of different stakeholder perspectives
Open Hardware	hardware with open licences and shared production documentation
Open Innovation	inclusion of more internal and external ideas to organizations' innovation processes
Open Internet / Open Web	keeping the layers of the internet stack open
Open Knowledge	making information available for all
Open Science	conducting the entire research process in an open, transparent and reproducible way
Open Source Artificial Intelligence	licensing and production/sharing practices for software, algorithms and training data
Open Source Software	software licensing and production/sharing practices

Source: Interviews, OKF/Wikimedia 2019, Tarkowski et al. 2023

Methodology

The insights from this paper heavily build on a series of expert interviews that we conducted in late 2024 and early 2025. The conclusions we drew from the interviews are our own. We also analyzed relevant publications for this paper (see references). We make no claims that our list of included publications and interviewees is exhaustive. Our aim is to present practical impulses for the future ahead.

We had the privilege of speaking with more than 20 people with highly specialized expertise who work in different areas relevant to Openness. Some of them have been part of the Open movement for many years, others were once activists for Openness and have since moved on. Others have not explicitly engaged in questions of Openness at all, but their work intersects with the topic in ways we found relevant. We tried to offer controversial hypotheses and challenged Openness in the hope to discover fresh impulses and contributions to the debate. Our interviewees have differing views on the usefulness of Openness, but we believe that they all share the need for strong engagement for a digital world that serves the public interest.

The interviews were insightful, inspirational and sometimes funny. We are grateful for the kind willingness of all these experts to share their knowledge with us.

A short history of Openness

Software, standards and protocols

At the most basic level, Openness as we consider it for the purposes of this document emerged in the historical context of the early computer days in the 1960s, where software code was shared relatively freely. In 1985, the Free Software Foundation was founded promoting "computer user freedom".[5] Since the 1990s, the Free/Libre Open Source Software (F/LOSS) movement gained significant momentum and to this day powers large parts of the internet's infrastructure but also the tools used for software development.

By the time that computers became a fixture in the business world, software companies started to lock things down by switching to non-open licensing models. In those days, Open Source had to prove its compatibility with business interests. Fears included that free things undermined legitimate business interests, that participatory systems would lead to security issues and that open systems would generally be inferior — fears that for the most part turned out to be unwarranted. By now, several decades into the digital age, Open Source has developed not just into a well-respected business model with a considerable economic potential (see EU Commission 2021) but also into a core pillar that supports the global IT and networking infrastructure.

At the same time, concepts such as Open standards and Open protocols emerged, promoting interoperability between different technologies to enable seamless communication and integration of systems. With the emergence of the internet, the underlying concepts were translated and adapted for the networked age, where compatibility and interoperability ruled supreme. When the social web — what today we call social media — emerged in the early 2000s, new networks were able to grow quickly because the most relevant social networking services had quite permissive machine-readable interfaces (APIs) that allowed one network to "piggy-back" on another by letting users move over their social graph — their list of friends — seamlessly. Instagram or Twitter grew quickly this way. Today, social networking platforms largely prevent APIs from siphoning off their user base. They are much less Open and actively attempt to lock users in.

Movement building from software to society

The discussion of Openness in the tech context has been influenced by the historically US-centric thinking around personal liberty and freedom of expression. Openness in the sense we discuss in this document is both a product of and a counter-reaction to the thinking critiqued in the Californian Ideology (Barbrook and Cameron 1995) as hyper-focused on individual freedoms and neo-liberalism: Where traditional American interpretations of liberty focus on individual freedoms, Openness and Open Source were simultaneously guarantors of these individual freedoms and a counter-reaction that focused on communal aspects (the Commons) as well as non-commercial intentions and mechanisms, i.e. volunteer production and free use. Those more communal efforts later manifested among other things in the Creative Commons (CC). CC nominally is a non-profit organization that maintains a content licenses scheme under the same name, but it is at the same time a global community of Open and Free Culture activists that emerged as part of the early 2000s online culture.

Around that time, the principles of Open — free sharing, collaborative production, permissive licensing — were adapted to a range of other areas. Notably, the Free Culture community created Open licensing models to bring the spirit and practices of Open Source software to content and media production as well as sharing.

Creative Commons[6], Wikipedia[7], and the social web all came into existence within the span of just a few years. The Creative Commons community might have been one of the central connectors across all branches of Openness. Wikipedia brought the spirit of Open to the collection of knowledge. The Mozilla Foundation[8] was founded in order to support free software products for the internet (Firefox browser and Thunderbird email client). The Open Knowledge Foundation[9] was founded with the objective to promote the Openness of all forms of knowledge and began to create a worldwide network.

[5] See Free Software Foundation's website: https://www.fsf.org/.

[6] See https://creativecommons.org, launched in 2001.

[7] See https://www.wikipedia.org, also launched in 2001.

[8] See https://www.mozilla.org/, founded in 2003.

[9] See https://okfn.org, founded in 2004.

By the mid-to-late 2000s, in lock-step with the emergence of Social Media, the Open movement picked up steam as well: In Berlin, an early hot spot of Openness, the Wizards of OS conference series[10] (1999 to 2006) explored the cultural and political potential of free and open digital technology, media and culture. The titular OS stood for operating systems, and the conference expanded the notion of Openness and the digital commons beyond the purely technological. Event series like Open Everything focused on network-building since 2008[11], and by 2011 a conference of the same name (and emerging from the same community) was launched in Berlin to explore these ideas further. Open Knowledge Festivals in 2012 (Helsinki) and 2014 (Berlin) brought together hundreds of activists from all kinds of fields "encouraging them to work together to build the very tools and partnerships that will further the power of openness as a positive force for change."[12]

Civic tech became a prominent umbrella term for software tools that were developed according to the principles of Openness and with a public interest purpose (*from* citizens for citizens). For over 20 years, civic tech ecosystems, which include a variety of actors, from business entities and tech start-ups to not-for-profit organisations, have played a pivotal role in the provision of digital solutions to public authorities and civil society as a means to empower citizens in democratic processes. One of the most prominent examples of such a tool is Decidim, a software combining political participation and community organizing.[13] From an individual "computer user freedom" - as we quoted the early definition of free software - Openness now also meant "production of social goods" (Keller and Tarkowski 2021). This motif of an evolving normative foundation will continue to be relevant throughout this document as well.

While Open activism grew larger, different organizations were founded and a huge variety of topics, methods and tools emerged, the people involved remained rather homogeneous. The majority of active contributors tended to share the demographic make-up of the IT and tech scene of the time: Young, white, male, with advanced degrees. The vast majority were based in North America or Europe. The lack of diversity has only been reflected critically in recent years.

Connections to other sectors and institutions

Over the last two decades, principles of Openness have been adapted to a wide range of institutions and sectors, including (but not limited to) government, education and academic research.

Inspired by the promises of technological innovations in global communications, information sharing and data processing, governments became increasingly interested in Openness. With the foundation of the international Open Government Partnership in 2011 by eight democratic governments (initiated by US-President Obama), Openness was seen as beneficial towards political goals:

> ***"OGP's vision is that more governments become sustainably more transparent, more accountable, and more responsive to their own citizens, with the ultimate goal of improving the quality of public policies and services, as well as the level and scope of public participation. This will require a shift in norms and culture to ensure open and honest dialogue between governments and civil society."***
>
> Open Government Partnership 2014: 5

From eight founding members, OGP has grown to 75 countries and 150 local jurisdictions in 2024 that work alongside thousands of civil society organizations. OGP's work is centered on Open Data as well as on collaboration between sectors: Governments acknowledge the relevance of dialogue with citizens and civil society in order to tackle real-life challenges and provide sustainable solutions.

[10] The website archive is still available at http://wizards-of-os.org.

[11] As this blog post highlights, the Open Everything event series was initiated rather informally by a network that centered on the "classic" open movement actors: Mozilla, Creative Commons, Netzpolitik. Creative Commons, 25. Nov 2008, available at https://de.creativecommons.net/2008/11/25/openevery-thing-berlin/.

[12] See website of OKFestival 2014: https://2014.okfestival.org/about-the-festival/.

[13] See https://decidim.org/, launched in 2016.

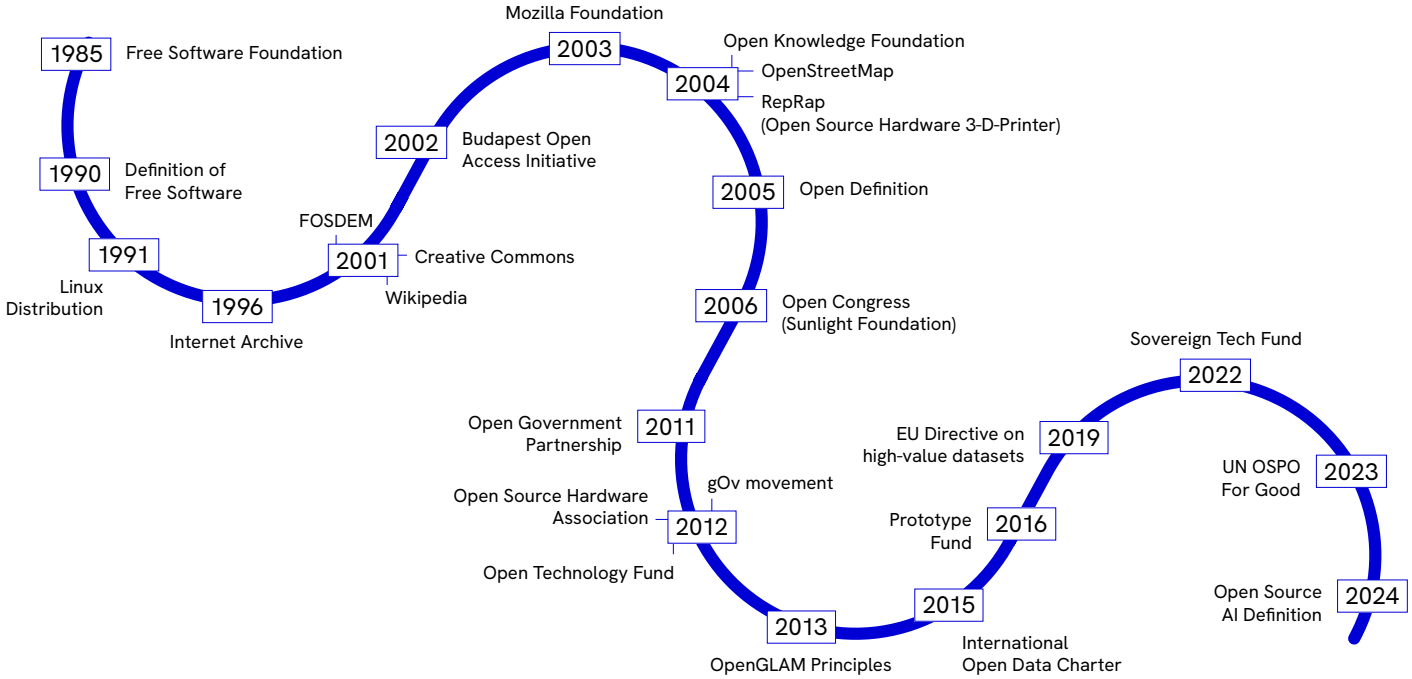
Similarly, in academia, Open Educational Resources (OER) and Open Access have been transforming their fields to be more Open on a global scale. OER aim to increase ease of access (and lower costs) for teaching and learning materials as well as knowledge certification. Open Access is an attempt to foster better academic research by establishing a counterweight to prohibitively expensive academic publishing. Open Access is a huge success story in the academic world; knowledge sharing, reproducibility of studies and global collaboration between researchers have been strong forces for Openness. In 2024, when the Nobel prize in chemistry was awarded to Demis Hassabis und John Jumper for their work on protein design at Alphabet's DeepMind Labs, commentaries marked it as the first Nobel prize for Artificial Intelligence. This is only half of the truth: The most important foundation for their work stems from a huge Open Data set that has been maintained and added by a worldwide academic community in open collaboration for many years.

Driven by technological developments, the field keeps changing

Just how quickly this field moves can be illustrated by the simple fact that in the span of less than two decades we have witnessed not one but two major technological shifts: First from desktop computers to mobile phones (starting at scale around 2006-08 with the launches of first the iPhone and then Android), and second with the emergence of generative AI (the most prominent example being ChatGPT, launched in late 2022). As we will touch upon later, these technological developments drew heavily on Open technologies, but sidestepped quite significantly the part where outputs and benefits would be shared back into the Commons. Along with these shifts, the web has become much more centralized around a handful of dominant platforms, and especially on mobile moved to walled gardens, which has "fundamentally altered the way in which this ecosystem operate" (Keller and Tarkowski 2021: 3).

In summary, Openness as a concept has truly established itself as a key driver of innovation and of societal value production. In a sense, and within certain contexts, Open won. That said, with each jump to a new technological era, the term has undergone a re-interpretation, a semantic shift. The movement itself as well as the environment it exists in have been changing rapidly, and not uniformly: It is an environment increasingly shaped by many different types of stakeholders, technologies that follow exponential and disruptive development patterns, and clashing ideologies. This makes for a complex picture. So what does Open mean today?

Chart 2: Timeline with (some) landmarks of Openness



Source: own compilation

The current state of Open

> *"The history of Openness is a successful march through the institutions."*

Openness has become a mainstream success

The brief history of Openness does not only acknowledge major achievements of different branches of Openness, but also shows that the concept has spread over different societal sectors: Civil society actors have pushed for more Openness and delivered tools and tactics for more Openness, academia has embraced Openness for knowledge sharing and collaboration, economic actors have discovered the benefits of Open Source Software and Open Data, governments have started to use Openness to organize political decision-making. Open has grown out of its niche and into the mainstream.

Today however, despite its success story, Openness is under pressure, both as a term and as a concept. Overwhelmingly, the experts we interviewed underline that the concept is still absolutely essential. At the same time, many do not use the term anymore because it can lead to confusion, has been overloaded with meaning or been watered down too much: Mainstream popularity comes at a price. More importantly, in a rapidly changing world order in which competition gains more importance over collaboration and market dominance is more desirable than building ecosystems, Openness has yet to find its place and regain its voice. Openness has not overcome capitalism, it exists within that larger framework. Other challenges come from within the Open movement. Many of the people that self-identify as part of the Open movement articulate that there is a sense of lack of purpose: Open is still good and important, but what is it for? How relevant is Openness for communities of practice outside its own bubble? It appears that Openness is having a moment of midlife crisis. If Openness has won, it is a victory in search of a vision.

We see four major issue areas:

- → **Conflicting and contested terminology and usage**
- → **Market consolidation leads to power concentration**
- → **Openness is increasingly part of geopolitics**
- → **Ongoing challenges for the Open movement**

It comes at little surprise that all four challenges for Openness that will be discussed next have strong touch points with the rapid development and spread of Artificial Intelligence. To highlight a few: AI is a big enough hype topic to draw and monopolize a significant share of attention that then necessarily leaves attention gaps elsewhere. AI is used heavily in software development, and thus both draws on and contributes to Open Source software, which leads to new dependencies and transparency challenges, and not all outputs that are created with the help of AI are contributed back to the Commons.

Conflicting and contested terminology and usage

> *"Today, Open is not just about software anymore, which means people will have to describe what they mean by Open."*

Beyond licences there is no shared meaning

A key issue is that Openness today has many competing interpretations: It is many things to many people and communities. As the concept of Open has been mainstreamed and become part of much broader discussions, there is a certain confusing and conflicting use of the term depending on its context. Open is mostly used as an adjective in combination with others: The UN's Global Digital Compact aims for an "inclusive, open, sustainable, fair, safe and secure digital future for all" (UN 2024: 1). Most of the time, stakeholders or organizations do not explain and define what they mean with their version of Open. The term is used by highly specialized organizations working towards their individual goals, by broader organizations from different backgrounds altogether, and by people from all over the world — and all these stakeholders project their own interpretations onto the term. The more contexts, and the more actors adopt the language of Open, the bigger the risk of its meaning being blurred. Many actors do not know or share the underlying concepts of Openness — a risk further reinforced by the fact that depending on the context, definitions are vague.

> *"Open Source AI would be great but is an illusion."*

The challenge of defining Openness of Artificial Intelligence systems

AI challenges the definitional boundaries of what this might mean in these types of complex technological systems. For AI to be truly Open, does it need to run on Open Source code, does it need transparency about training data, do the training weights need to be published, or the governance structures to be participatory? Widder et al. argue that a focus on source code is far too narrow because it "fail[s] to account for the significant differences between large AI systems and traditional software" (Widder et al. 2023: 5). So far, the most comprehensive answer to this question was published after a process convened jointly by Columbia University and Mozilla (see Basdevant et al. 2024; Tiwari 2024). While it was well received, it will still have to prove its staying power and impact. The OSI's recent definition of Open Source AI (Open Source Initiative 2024) has been contested right out of the gate, especially because access to training data is not provided.[14] It is too early to tell if one of these frameworks will prevail or if a different one will become canonical. In the meantime, at least some actors indicate that they aim to develop truly open AI models.[15]

[14] For a quick overview of criticisms of the OSI definition of Open Source AI, see Jürgen Geuter's arguments available at https://tante.cc/2024/10/16/does-open-source-ai-really-exist/.

[15] Most notably, see the recent announcement of a series of European Open foundation models: https://OpenEuroLLM.eu.

The danger of Openwashing

> *"We do not have a mechanism to shame wrongful use of Openness."*

Openwashing — a reference to greenwashing — describes the practice of pretending for products or initiatives to be much more open than they actually are because Openness carries strong positive associations.[16] For many people, the operating system Android still counts as the open alternative to Apple's closed iOS. While Android is a free software, it usually comes on your smartphone with a variety of preinstalled proprietary apps from Google and without the possibility for customers to modify or delete parts of the software. AI companies like OpenAI claim that their AI products are Open when in fact they are clearly proprietary (see Widder et al. 2023 for dismantling companies' strategies). The EU's AI Act (2024/1689) includes exemptions from compliance and reporting duties for AI systems that obtain free and open source licences. These exemptions result from successful lobbying efforts of AI companies - using the positive framing of Openness. What those exemptions mean in practice is unclear. Openwashing presents a risk to Openness because it dilutes the meaning of the term and adds noise to the debate.

Openness, commons, sovereignty, infrastructure - a crowded namespace of overlapping concepts

> *"There is no perfect term. You pick one and work hard on a strong narrative."*

Open exists in a crowded namespace of related but not fully interchangeable concepts. Some of them differ meaningfully, others simply use different terminology for historical reasons, or to better interface with the political contexts they are used in. For example, the United Nations refer to *Digital Commons* as their vision for a positive future. Discussions about tech stacks and infrastructure currently run as *Digital Public Infrastructure* (DPI). But organizations such as Open Future introduced the distinction *Public Digital Infrastructure* (PDI) to stress the public governance part of infrastructure. Germany's Sovereign Tech Agency started using the term digital base technologies before refocusing their communications towards *digital sovereignty*. Some of these terms differ in nuance or priority, others mean different things, but all share in common that they were picked to work in their specific (societal, political, organizational) context. They all are connected meaningfully to the concept of Open, but it makes for a crowded and somewhat confusing space nonetheless.

[16] See https://en.wikipedia.org/wiki/Openwashing.

Openness and free speech are misused for anti-democratic goals

Sometimes actors also misuse the term in bad faith for political gains. For example, we have seen attempts to misuse Openness in the context of larger free speech vs hate speech debates. Right-wing populists have been trying to claim the language of Openness and free speech for their cause by arguing that Open platforms and an Open exchange of ideas are key to prevent the censoring or suppression of speech. This tends to be a strawman argument with the intent to avoid the consequences of anti-harassment policies: By trying to preserve the right to harass others online unhindered, they aim to intimidate and silence their political opposition.[17] By suggesting that Openness is required for free speech, the lines between free speech and challenges to governance structures get blurry. It seems plausible that the term Openness might take damage as a side effect.

Market consolidation leads to power concentration

> ***"The conflict line with big tech is not about Openness, but about their grab of power."***

There is an extreme market consolidation in today's platform economy

The consumer web — the platforms we use for search, social media and e-commerce — has consolidated around a small number of centralized platforms. These platforms are owned by even fewer companies, notably: in the US, Alphabet, Amazon, Apple, Meta, Microsoft and X; in China, Alibaba, ByteDance, Tencent. Due to inherent network effects and pro-market regulation (and lack of antitrust regulation or enforcement), the internet has enabled and amplified winner-takes-all dynamics in the market. For example, the market for cloud services is massively dominated by those companies that can offer "hyperscaling" due to their vast market share and own server capacities, e.g. IBM, AWS, Google, Microsoft. Increasingly, the same companies also own and control large parts of the physical digital infrastructure and hardware (like data centers, satellites, chips). When it comes to the necessary compute for AI research, this effect is even stronger.

The terms for Openness are written by private companies

The tech industry is a billion dollar industry, selling software, hardware, services, user data. The key to monetization is to keep customers on your platform and engage them in active participation. The strategy to success is two-fold: companies make it harder to switch services by restricting interoperability and not providing APIs. Also, companies expand their own services to make it seem unnecessary to switch services. Sharing practices are highly encouraged and the positive connotation of Openness is actively used - but only under the terms and conditions of one company and also for the benefit of this one company only. Critics refer to this phenomenon as "walled gardens", especially with regards to smartphone apps (see Keller and Tarkowski 2021: 3). Studies on digital literacy of teenagers and young adults regularly point out that a growing number of people do not even know that there is "another internet" outside of social media apps. Recent developments point to "app-free" devices that rely on AI agents as a single point of access to internet services. The walls around these new walled gardens will be even higher.

[17] As opposed to protecting free expression by creating structures where vulnerable groups can participate in debates without fear of harassment and hate speech, as argued by the other side.

Many AI models are trained on non-open and even pirated content and – in a bitter turn of events – lawmakers see the companies in charge as too big to fail and refrain from sanctioning extractive practices. This is in stark contrast to the fierce fight against the digital commons with ever-longer copyright extensions and the decades-long crackdown on online content piracy.

Big Tech CEOs influence politics

Ownership and control of this generation of tech companies often resides disproportionately with individuals, these individuals also unite disproportionate financial resources and attentional power among themselves. X's owner Elon Musk is one of the wealthiest individual globally, Amazon's founder Jeff Bezos also owns an influential newspaper, and Meta founder Mark Zuckerberg controls three major platforms; all three have demonstrated that they are able and willing to exert control over day-to-day operational aspects of how these companies are run, all the way down to actively steering content decisions. This is relevant as leading up and following the recent US elections, the owners of some of the biggest tech platforms have been involved to varying degrees in party politics, and/or aligned themselves and their content moderating policies with the incoming administration's preferences. This is illustrated vividly by the fact that at the time of writing, Musk is a regular fixture in the Oval Office. The proximity of platform power and political power means that these individual owners have tremendous shaping power over our informational and communications sphere, and they have demonstrated that they are willing to wield that power, too. Discussions of Openness in the context of digital technology will by necessity have an additional political dimension.

In highly political times, there is no neutral technology

As Kranzberg's First Law famously states, "Technology is neither good nor bad; nor is it neutral" (Kranzberg 1986). Every tool provides certain affordances while withholding others. Social networks and their algorithmic recommendations and content dissemination by definition amplify some types of content while throttling the distribution of others. This can happen with more or less intent, but it always happens. The same is true for the way generative AI generates its outputs: The type and content of answers an AI powered chat tool produces is based on inputs that are necessarily biased in many ways. At the time of writing this, the US president had just suspended all AI regulation in the US, including safeguards like AI risk assessments. Where before we saw a push towards transparency and Openness in AI and algorithmic content management, we now have to assume that new policies and practices will shape the field going forward. The implications for the global field of social networking and AI and their impacts on global regulation, global markets and on democracies around the world are subject to speculation. We do know one thing, though: These technologies, and the political assumptions that guide them, are not neutral.

Openness is increasingly part of geopolitics

We see the following threads of global political development as immediately relevant. There are many more to consider. These are interconnected and not fully separable, but can serve as helpful markers. Digital technologies and the infrastructure that powers them are increasingly parts of geopolitical considerations.

Transition from a unipolar to a multipolar world

Open Source specifically came to prominence in the time after the Cold War, starting in the early 1990s. As Ansgar Baums, author of "The Tech Cold War" describes it (see Schumacher 2024), Open Source matured in the context of a unipolar world order. Geopolitical considerations were not, back then, a major aspect of consideration in governance questions of tech politics. On the contrary, the Open Government Partnership was launched (2011), building on global knowledge sharing and collaboration, and the UN declared the Sustainable Development Goals (2015) in the belief that the time has come to solve the biggest challenges for humanity. Now, the world order is increasingly multipolar with more competition than collaboration between the US, China, Russia and Europe. Control over global supply chains and market dominance through technological breakthroughs rank high on political agendas. From this, new challenges arise which Openness needs to address.

Access to resources for Artificial Intelligence is essential

In political circles it is widely accepted wisdom that AI is not just key for economic development but is increasingly a key factor for military strength (i.e. national security), too. The major global power blocs all seek to maximize their own access to compute power and dominance over the supply chain[18] while trying to minimize their adversaries' access and control. In an industry that is historically extremely globally integrated, this leads to enormous complications. Political contentions range from where consumer AI startups and research centers are located all the way down to who has access to and control over the necessary hardware (chips, servers) and manufacturing supply chain (semiconductor production and advanced research and development). How open research & development, manufacturing, product development, and trade are organized are all key considerations in this space.

Efforts to reduce dependencies by digital sovereignty

Currently, many countries worldwide are heavily dependent on digital and technological infrastructures they do not control themselves. As described earlier, a few tech monopolies dictate the terms of engagement. In a world that is shifting from global collaboration to regime competition, dependencies are becoming increasingly problematic. In Europe, Openness is a key consideration in discussions of digital sovereignty, meaning less dependency from tech monopolies and more focus on own infrastructure. Most recently, the EuroStack initiative is a prominent example (see Bria et al. 2025). From Open Source to Open protocols, standards and interoperability initiatives, Open approaches bring affordances and challenges that impact geopolitical considerations. However, critics fear that US monopolies will just be replaced by new European ones, reducing sovereignty to a "Made in Europe" label.

IT security considerations become more prominent

In the past, Open Source has proven to be a software methodology that can lead to excellent security outcomes. Increasingly, the governance structures (or lack thereof) built for a unipolar world and with good faith collaboration in mind are at risk of becoming a liability. If geopolitical adversaries use these softer, more volunteer-driven governance structures as an attack vector like in the so-called 'Jia Tan' hack (see Vasquez 2024), security considerations

[18] Please note that at the time of writing, a new AI model out of China called DeepSeek was released as Open Source and due to claims that its training was scales of magnitude less resource intense than traditional AI models, it sent the stock of US AI companies tumbling. If these claims turn out to be true, then it is hard to foresee how much the role of access to computing capacities will change in the future.

become more prominent. As multiple experts pointed out in our interviews, this takes on a special geopolitical relevance since most of all China explicitly has an Open Source strategy that both uses Open Source and Open Data resources to further the country's political goals, and seizes on potential vulnerabilities of these Open Source governance structures. Other countries might follow. Also, companies - under the pressure of their governments - might decide to stop engaging in Open Source projects or maintenance work which would weigh heavily on the global software production. In other words, Openness can become a risk factor.

Ongoing challenges for the Open movement

> ***"The great idea of freedom from back then is naive today."***

The fight for more Openness in a wide range of areas was a strong driving force of the movement. The aim to *open up everything* was a great unifier. After 20+ years of activism this does not quite work anymore. Today, Openness is not a sufficient goal in itself. A critical reflection on the achievements of Openness has taken place in the movement: Has the struggle for more Openness led to stronger democracies, higher participation, more social justice, better political decisions? Is it advisable to keep on pushing for more Openness or to better understand the roadblocks and challenges that Openness implies and to look for compromises? The results are inconclusive and do not deliver a clear picture.

Enforcement mechanisms need to evolve to match new realities

> ***"Openness now is more associated with extraction than with positive values."***

Rapid technological developments and newly emerging use cases mean that existing mechanisms to manage Openness — both legal and technical — have not held up to new realities. Existing licenses, for example, which included (or at least suggested) notions of fairness appear to be insufficient for current use cases. For example, Wikipedia is heavily used to train AI models, but there are very limited content or financial contributions back to the Wikipedia commons. This is not a violation of the letter of the license, but some argue that it violates the spirit of the agreement. There are concerns that this could lead to backsliding in Open Data practices, possibly even a so-called "data winter", where less and less data is shared openly for fear of AI training and similar extractivist practices (see Verhulst 2024). The underlying theories and assumptions as well as enforcement mechanisms of Open need to evolve to keep up with ongoing developments.

Sharing practices have led to unforeseen consequences

Openness in its original framing might have had unforeseen consequences. Some of them arose from a natural divergence of theory and practice, others from the way that the technological and political environment developed. Either way, there is a wide-spread sense that there is reckoning to be done for the people inside the movement. A concrete example given in our research interviews focused on the unintended consequences of encouraging users to share more photos under Open licenses, an act that was considered a contribution to the digital Commons: By now, these photos are routinely scraped to train facial recognition AI by commercial — and plausibly state and non-state actors — with questionable motives. By promoting Open sharing of user-generated content, the Open movement has actively contributed to a situation where that content is used in ways that might contradict their and the users' interests. In other words, the underlying concepts of Openness ended up solving some problems but also creating new ones. The same is true for the role that the Open movement itself has played in bringing about some of these more dystopian aspects of the technological and political landscape today. Resolving these tensions will take ongoing work and reflection.

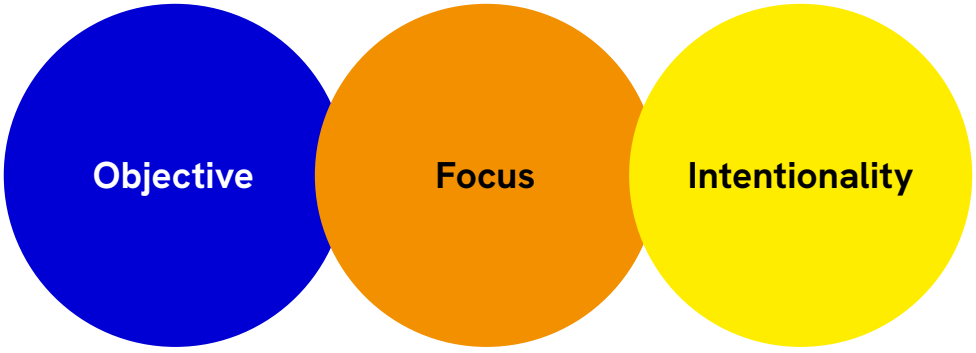
Lack of diversity and global perspectives

It is worth noting that the activists of the early Open Movement days, in broad strokes, tended to be rather demographically homogeneous. This lack of diversity has at least three essential implications for this study: 1) The Open Movement was driven by individuals with tremendous levels of privilege. 2) Many voices and perspectives were missing or significantly underrepresented in the discourse at the time. 3) Two decades later, the founding generation of the Open Movement has entered middle age. As Openness enters its next chapter, questions of diversity and power distribution will necessarily have to be much more centered. Addressing coloniality, to highlight just one aspect, is a central aspect of how Openness impacts communities in the Global South, and who gets to benefit from (and make the rules for) applied Openness.

What comes next for Openness: Scenarios

In the following we illustrate three different scenarios for the future of Openness. From our perspective, these scenarios are all within the realm of imagination and plausibility. They take into account the history of Openness, achievements to date and current challenges. The baseline of our scenarios is in line with our expert interviews, namely the assumption that Openness is still relevant, and possibly even more relevant than before because it is a much more mainstreamed concept than in the past. From our interviews, we cannot derive a clear direction for Openness; all three scenarios have supporters and critics. However, we do recognize a slight tendency towards scenario three and share this.

Each scenario is presented with its own qualities, opportunities and risks. Please note that these are distillations to highlight differences; in reality, things will always be much more nuanced and blurry. These scenarios are intended to distill and contrast different approaches and priorities of Openness along the **dimensions objective, focus, and intentionality.**



process — purpose

Objective: In this dimension we distinguish between a more process-oriented and a more purpose-oriented approach. Process orientation entails a stronger focus on rules and procedures to achieve more Openness, for example to follow the steps of Tim Berners-Lee's 5-Star-Open-Data scheme.[19] A stronger purpose orientation focuses on the question: *Open for what?* Here, there has to be a larger goal beyond Openness itself, for example more social justice or economic prosperity.

tech — society

Focus: In this dimension we distinguish between a narrower and a broader focus. A narrower focus of Openness emphasizes questions around data formats, licences and software (i.e. tech). Those have been the historical key components of Openness (see the Open definition). A broader perspective includes considerations on how to organize Openness with regards to inclusiveness, participation, civic engagement, checks and balances, governance structures (i.e. society), and to apply them to areas other than software and content.

emergence — intentionality

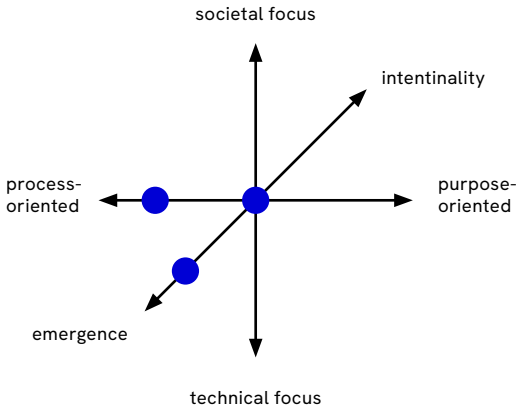
Intentionality: In this dimension we assume that it is also decisive for the future of Openness whether there is a strong or weak intentionality, especially when deciding about the way forward with regards to the two dimensions above. Is the field left to a marketplace of ideas, or cultivated and shaped by a movement or another form of collective action (e.g. partnerships, alliances, leadership) with intention and a direction in mind?

[19] See Tim Berners-Lee's 5-star deployment scheme for Open Data: https://5stardata.info/en/.

Scenario 1:
Go with the flow

Description
Openness may not be the most salient rallying point, but it has proven a strong enough concept to stay relevant. The term is understood widely enough to stand on its own and has a positive ring. Following a marketplace-of-ideas approach, the various groups and communities using Openness coexist and new ones might enter the space anytime. While frictions occasionally arise, history shows that this coexistence has been working well enough. Some groups focus on a reform of licences, while others organize community events and discussions. Some actors regret that the Open movement has not regained its once powerful force, others are relieved that not every technological development needs to be scrutinized by criteria of Openness. If anything, Openness has shown tremendous resilience during times of rapid and significant technical and political developments, and it is set to continue to show resilience and adaptability going forward.

Scenario 1: Go with the flow
process-oriented, technical focus, high emergence



Opportunities
Flexibility is a main asset in this scenario. Interested actors might engage with promising branches of Openness and contribute to strengthening those. Also, in different social or geographical contexts, different aspects of Openness might be underlined and fought for. Without much intentionality and purpose, actors of Openness might be more open to building new alliances and to allowing compromises. In an increasingly complex world, it is important to be able to work with complexity, e.g. be able to adapt and respond to different needs and demands. For example, governments' efforts to open up data sets and to build open data portals for PDF and .xls files might not seem like the most advanced steps of Openness in 2025. However, those efforts are still extremely relevant for reasons of government transparency and accountability. There will be different paces and different kinds of success stories of Openness. Other groups, from industry to across the political spectrum, also use the term. Sometimes the various groups' agendas align, allowing for stronger collaboration. At other times, they diverge, and Openness will continue to adapt to meet these new evolved needs.

Risks
Flexibility might lead to an even higher blurriness of the concept. By letting things flow without intervention, Openness might increasingly become arbitrary and toothless. It might lose relevance. Openness is also at risk of political capture and increasing Openwashing if there is no counter-narrative. Without a larger purpose, success stories of Openness might be rather tactical gains than actual transformational change (e.g. more Open Data sets, but no better political outcomes). Other movements might develop much stronger rallying forces reducing Openness to a (once relevant) background noise from the past.

Scenario 2:
A pure version of Open

Description

In order to depoliticize the term, the technical side of Openness regains importance. The center of gravity of Openness has been a set of rather clear technical and legal components: open software, open formats, open licences, spelled out in the 4 essential freedoms and the open definition. Technical communities, traditionally with very high expertise in software development, press for more rigorous applications of Openness. This means tightening the definitions of what Openness means in its various use contexts. Areas that are not technical or legal — that do not primarily focus on software and licensing — are considered out of scope. If an initiative passes the much higher bar set by these stricter definitions, it would count as truly Open. Of course, much fewer initiatives will pass that bar.

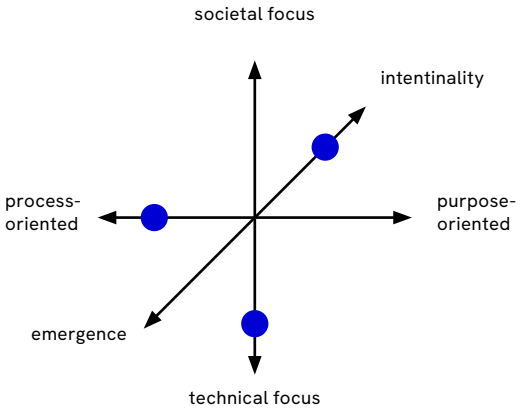
Opportunities

Openness regains clarity in that the concept sticks to technical and legal aspects. In an increasingly complex world, reducing complexity with a clear-cut understanding of Openness is very appealing; it is an understanding that is driven by technological experts, who are attributed competence and excellency (in contrast to political actors or activists). This scenario does not only look back to its roots in software development, but it builds upon the most successful branch of Openness, Open Source Software, and brings this focus to new relevance: It might lead to strong reforms of existing licence models and software tools that cater to the needs of new technologies. Clarity in definition also brings the opportunity for more forceful actions against misuse: Openwashing can be dismantled more effectively when referring to a clear definition. The understanding of Openness might be shared more globally when it centers on technical terms rather than on a political vision. This might lead to a stronger alignment between actors of Openness and more global collaboration.

Risks

This much more narrow interpretation of Openness pushes out many actors and organizations that are not part of a core Open movement but consider themselves allies of Openness. Compromises on Openness are not encouraged, and new alliances might become much harder to build. The understanding of Openness is agnostic of its outcomes. Negative effects or unforeseen consequences of Openness are not regarded as part of the concept. Those would need to be addressed elsewhere. In a highly political context, it might be a huge risk to rely on technological answers only.

Scenario 2: A pure version of Open
process-oriented, technical focus, high intentional



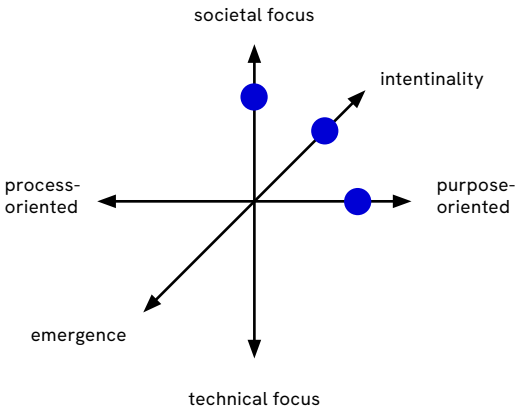
Scenario 3:
Towards a new purpose

Description
In a world where societies are increasingly shaped by the technologies in place, tech policy needs to address how technologies contribute to societal values, like prosperity, security, freedom, justice, sustainability. A narrative on purpose needs to be added to the concept of Openness. Some branches of Openness have traditionally been stronger and more explicit on defining purposes, e.g. Open Government (purposes: transparency, participation, better policy outcomes), than others like Open Data and Open Source Software. However, actors in all branches realize that a void in purpose will lead to misuse and unintended consequences. Outcomes matter. The more purpose-oriented branches of Openness will push for adding purposes to the definition of Openness.

Opportunities
Openness needs to answer one simple question: Why should I engage in Openness? By connecting Openness with other societal issues, debates and movements, it might gain relevance and regain rallying power. With a compelling narrative on purpose, the concept of Openness can show that it has valuable input to current debates. Salient questions like what should a technology be used for, who should profit from it, how should oversight over automated systems be organized, go beyond technical aspects and need broader answers. Also, it is an opportunity to connect past achievements and learnings with present and future demands: technical and legal requirements and desired outcomes and purpose are two sides of a coin. A stronger purpose-driven approach might balance the weak point of the Open movement with regards to being too Western centric, privileged and homogenous in views.

Risks
By shifting from a result-agnostic to a more guided approach, a subset of actors and communities will likely leave the larger Open umbrella. Disagreements between tech communities and purpose advocates might have a negative impact and alienate interested actors. It will be hard to agree on a larger purpose for Openness and to codify it. Adding a political component to the concept also increases its attack surfaces as it might increasingly be pulled into ongoing culture wars. By nudging Openness in one direction, the essential freedoms are inherently curtailed — certain high-risk or exceptionally damaging use cases would be prevented by design.

Scenario 3:
Towards a new purpose
purpose-oriented, societal focus, high intentionality



Recommendations for the future of Openness

Openness needs an update. Our recommendations for the future of Openness start here: For many stakeholders the relevance of Openness takes the shape of a guiding principle in the background rather than as a primary purpose. Openness is increasingly implied by or associated with other terms. It is still recognized as bringing value to the table while largely having lost its rallying power to activists and communities. In other words, it is important, but not the driving force. These observations lead us to two assumptions that inspired the formulation of the recommendations in this chapter: First, many issues of Openness go beyond its technical core and touch upon society. We believe that these days there are no easy answers and no technological solutions to societal questions. Openness needs to address complexity rather than attempting to reduce it. Second, the term itself does not need to be at the center of attention. Openness is not an end in itself. Openness should be about outcomes, and whether we use the term Openness or other concepts to reach a desired outcome is secondary.

In this chapter we make a number of recommendations, clustered into three rough buckets: Under Rethinking Openness, we suggest approaches for an intellectual reframing of the concept of Openness. Under Strengthening the foundations, we recommend concrete measures in the realm of the day-to-day work that goes into strengthening the field and applying Openness towards solutions. Finally, under Addressing power & markets, we focus on how to tackle some of the fundamental challenges and barriers that structurally get in the way of all the other things we highlighted before.

Rethinking Openness

Openness needs to serve a purpose

> *"Openness needs an AND operator."*

A key theme across many of our expert interviews was that Openness needs to be contextualized to serve a purpose *other than Openness*. In the past, it was quite acceptable to advocate for Openness for its own sake regardless of specific outcomes or consequences. The underlying assumption was that many societal issues came from restrictive policies and practices (that were considered "closed" or proprietary), especially around content and software licensing, and that Openness would be an effective counter strategy. By now, the environment we operate in has shifted enough that this is not the dominant narrative anymore. Openness needs a new value proposition that defines what the goal behind Openness is and who will benefit from it: add a purpose and make it explicit. In our interview Audrey Tang suggested including *an AND*[20] operator to the formula: Openness alone does not suffice, so it is Openness AND [another purpose] that should go hand in hand.

The value proposition can range from economic considerations (like price, quality, security, profit) to more societal ones (like justice, welfare, development, inclusion) and also overlap (like in the case of resilience and sovereignty) - just be explicit. For us, Openness needs a strong society-oriented purpose because our societies are more and more shaped by technological developments. Most compelling suggestions for society-oriented purposes are Openness in service of the public interest / the commons, in service of social justice and democracy as well as in service of reaching the Sustainable Development Goals (SDGs). While the SDGs are defined in great detail, other purposes would need to be mapped out: What is meant by public interest or social justice?

[20] A play on Boolean logic: With an AND operator, two conditions need to be met for a statement to be true.

Openness is a way to organize society

> ***"Communities want and need protection from misuse."***

The way we think about Openness is about tools and mechanisms, but also about an underlying philosophy that favors participation, inclusion and accountability. The modes of production are as important as the freedoms to use the product. This has to be reflected by the concept of Openness. Openness needs to spell out how to combine a participatory approach with inclusive and diverse engagement, a governance structure that guarantees protection and rights as well as it provides checks and balances and learning mechanisms. To name a few options, Tang proposes for Open to take into focus "Choice, Voice and Stake."[21] Joana Varon suggests that the stakeholders of Openness should learn from feminist theory by attaching Openness to "commons, consent and coloniality," i.e. that Openness cannot be meaningfully discussed without addressing power dynamics and meaningful consent: Openness should not "happen to" communities. Rather, it needs to be discussed and implemented with consent and on eye-level so as not to further perpetuate power imbalances (be it between global regions nor between global corporations and local communities).[22] The embedding of community needs into the process of creating Openness is a challenge. For example, indigenous communities have largely not had the agency to determine whether and how they would employ Openness as a principle. After all, there are power asymmetries at play and whoever determines the rules tends to benefit more.

Openness cannot be discussed without considering colonialism, extractivism and potential harms. Openness needs to be tied to the ideals of the Commons in order to prevent exploitation. Vulnerable groups need to be protected from potential abuses of Openness. If we take the added purpose more seriously and not make Openness the goal, discussions about protection and potential harms for communities might be less complicated and tense. Openness is as much a paradigm for governance as it is a mechanism for peer production. It is, in other words, a way to organize society.

Collaboration leads to relevance

Openness requires an ecosystemic perspective. Its relevance and its societal contributions hinge on connecting to other stakeholder groups, communities and issues outside its own Openness bubble. It seems worth adopting a mental model centered on alliances and issues instead of a movement. Collaboration works well and dramatically increases the chance for impact, just as ownership over issues and processes is important for success.

This requires an active effort to truly build bridges and make connections, i.e. identifying other causes that are aligned and complementary enough with the purposes of Openness. Since the remit of Openness has historically been expansive (from Open Source to Open Everything) anyway, this appears to be a logical next chapter. For actors in this space, thinking in terms of alliances also means finding clarity within their communities about compromise positions and potential red lines. Hence, narrative work will continue to gain in importance in order to attach Openness to large societal issues, political debates and existing frameworks like for example UN Sustainable Development Goals, antitrust policy and attempts to explore traditional power imbalances. This narrative work will be foundational for new alliances.

[21] Choice refers to users' ability to migrate/exit a service; voice refers to the ability to meaningfully participate; and stake means the ability to benefit as well as to give back.

[22] For a discussion of manifestations of colonialism embedded in cutting-edge digital technology, see Varon and Peña (2021).

Strengthening the foundations

Protect Openness by adding guard rails

The very concrete challenge we see at this point in time, specifically with the rise of AI, is that it actively hurts Open projects online, or as researcher and writer Molly White puts it distinctly: "The real threat isn't AI using open knowledge — it's AI companies killing the projects that make knowledge free" (White 2025). For a healthy larger ecosystem built with Openness and societal benefits and public interest in mind — for meaningful openness — we need both rules that prevent abusing licensing mechanisms that were designed for a pre-AI world, and strong enforcement of these new as well as existing rules. Currently, these new rules do not yet exist while the enforcement of existing rules does not work well.

Such a rule might be to curtail one of the essential freedoms: the freedom to use a tool for any purpose. This is not a call we made lightly, but one we deem necessary.[23] The described case of AI highlights why: Some technologies are simply considered too powerful to be used without restrictions. We oriented our recommendation after the European AI Act's requirement for even Open Source AI foundation models to incorporate risk mitigation obligations — safeguards against abuse. We expect there is currently room for more experimentation and a real window of opportunity for innovation in licensing. To highlight just a few threads we have noticed to give an indication: A strengthening of share-back mechanisms (like the share-alike clause in Creative Commons licenses) seems like a useful approach, especially when it comes to the outputs of generative AI systems. In a similar vein, how especially Open Data is collected, structured and shared in the context of AI remains a challenge. One suggestion is to expand the FAIR principles [24] to include an AI-readiness stipulation (Verhulst et al 2025). The United Nations' Office for Digital and Emerging Technologies defines Digital Public Goods,[25] among other things, as having three essential characteristics: They need to be Open Source and Open Data; adhere to the UN's do no harm principle; and be aligned with Sustainable Development Goals. In other words Open, non-harmful and tied to a purpose.

Simultaneously, we expressly do not suggest to pull back into a discourse bubble. Rather, we recommend building from foundational values towards a purpose by reaching out and expanding. We also recommend doubling down on the claim on defining what Openness means, to defend its meaning against political and corporate capture. This goes hand in hand with our suggestions below to strengthen the overall ecosystem through capacity building and narrative work.

It is hard to predict whether new licensing rules and stricter regulation - together with more vigorous defenses of Openness against capture - will lead to success. We should also consider taxing those companies to account for their profit from extraction practices. Recently, digital taxes for Big Tech companies are being discussed in the European Union as a response to the newly introduced tariffs from the US government.

Open innovation and infrastructure need investments

We need a mission-driven funding strategy towards Openness. A mission can be understood as an ambitious transformation goal for a society. An example could be to provide for a resilient tech infrastructure for our democracy. This mission would involve huge efforts; it could only be realized if different sectors commit to this mission (state and non-state actors) and engage with different roles and responsibilities but also connect in meaningful ways: First, the foundations for innovation need to be widened: Research and development capacities at research institutions need to be strengthened and connected; competencies in digital literacy need to be fostered at all levels. Second, a broad ecosystem for testing ideas needs to be built for start-ups and civic tech initiatives to prototype software, analyze data or build algorithms. Third, if ideas are working we need to build structures to scale products, customize them and make them available to use (permanently). Fourth, when innovation is turned into infrastructure we need to provide a stable system to run products and ensure availability, quality, security, and all the standards we want the product to have.

[23] It is important to note that this applies only to those areas that are not primarily technical or legal, in other words not to Open Source Software or software/content licensing. Those areas work well with strict and (at least theoretically) enforceable mechanisms. We explicitly recommend preserving the definitions of Open Source and Open content licensing. Instead, this applies to those other, less clear-cut societal and governance questions.

[24] The FAIR principles have been promoted by the GO FAIR initiative that aims to implement the FAIR data principles, making data Findable, Accessible, Interoperable and Reusable (FAIR), see https://www.go-fair.org/go-fair-initiative/.

[25] See https://www.un.org/digital-emerging-technologies/content/digital-public-goods.

There is no one-size-fits-all solution to fund these different components. In our opinion, short-term funding for prototyping, sketching out use cases or testing algorithms might be suitable for foundations and other non-state actors who aim to showcase fast results and give some directions for further developments. The more things need to be oriented in the longer term, the bigger the role of governments becomes: Infrastructure needs long-term commitment and funding; public-private-partnerships also might be a feasible way for long-term engagements. It is our conviction that governments should play an important part in defining missions and funding their realization. The recent ideas of an EuroStack are a holistic package of designing a European Alternative for most important layers of the tech stack. They combine economic and society-oriented purposes and underline the importance of Openness (among other values). European policy-makers should consider adopting those recommendations.

In order to accomplish a mission, tech funding needs to go beyond tech funding. Maintaining, promoting and advancing innovation ecosystems takes time, people, effort and infrastructure. Among others, it requires stakeholder coordination, advocacy, legal and communications work as well as the infrastructure to support all of these activities. In our example, it might make a lot of sense to fund a critical tech NGO as a building block to ensure quality and standards of our resilient tech infrastructure. Public and private funders need to expand their understanding of building innovation and infrastructure ecosystems that require technological, social and financial capacity-building.

Building more compelling narratives

Discussions on Openness have been too abstract for people outside of its own peer group. It can be misread as a fixation on technical details losing track of the bigger issues at stake. A renewed communications strategy needs to address concrete benefits of Openness for specific stakeholders and include success stories of Openness. It is advisable to be specific, for example by breaking down the relevance of Openness by going through each layer of a tech stack: You can find Openness everywhere.

> ***"What narrative about Openness can we offer interested parties?"***

Communications should be purpose- and not Openness-oriented (why do we engage and who will benefit?). Communications should also address possible hesitations and deliver answers, especially on issues like misuse, extraction, exclusion from benefits, security.

Openness can serve as a communicative tool to nudge discourses towards a new direction, to manage complexity, open up new resources or to increase stakeholdership and resilience. For example, Openness as an inherently multipolar approach can be a counterpoint to closed, unipolar, linear processes, and it can be a stepping stone towards distributed governance models. This way Openness can be helpful when discussing governance questions, especially if the goal is to move from centralized planning models towards a logic of empowerment.[26] This requires narratives that connect Openness to other issues (and vice versa), and that expand the scope of Open.

A strong civil society

A strong civil society with the capacity to track, analyze and make meaningful interventions in ongoing developments is essential for all societies. It takes capable watchdog organizations to uncover openwashing; it needs organizations that engage in advocacy to make sure that Openness is considered across a wide range of policy areas, as well as it needs organizations that can help build coalitions around issues and Openness through coordination and narrative work. Moreover, civil society organizations and actors are often creative, inventful, and resourceful when it comes to production: data analyses, software prototypes, hardware designs are often developed with no economic intention but with the idea of building something useful. These products but also the communities of production are most valuable for societies since they deliver meaning, self-efficacy and belonging.

[26] One expert importantly pointed out that Openness does not automatically overturn existing power dynamics. Rather, it can make power dynamics move from a central point into the network and hence make it harder to address. Power does not disappear and often will remain located in the exact same spots (who decides budgets, access, rules or narratives), but hidden from plain sight and harder to hold accountable. This makes it important to be clear and intentional if the focus is Openness or accountability, if a debate is really about licenses, responsibility or political positioning.

A boost for digital literacy

We need a stronger focus on digital literacy that centers on connecting technology with society, on creativity and critical thinking, and on being humans rather than users. Competencies in dealing with and developing Open technologies should be promoted in life-long learning efforts. Open Educational Resources should be used as a matter of principle so that everyone can engage with the use of digital media and technology with increased self-determination and critical thinking. A critical examination of technologies can be integrated into learning processes, particularly through the use of Open Software and Open Hardware. This allows learners to broaden their perspective from use to deeper understanding and reflection.

Government data still needs to be more Open

We live in complex times: Global security crises, planetary emergencies, polarized societies, scarcity of resources, a weakening of democracies and a rise of authoritarianism all add significant friction. Governments are under pressure to respond to multiple complex, interlinked challenges. Nevertheless, it is time to take action and solve problems. We believe that Openness, transparency and democratic deliberation are all essential to find sustainable solutions for these challenges. In order to regain trust in democracy and democratic institutions, we need governments to work transparently and comprehensively for citizens.

Access to knowledge (and digital literacy) enable active participation in shaping a society where the lines between digital and analog have long stopped being meaningful. This goes globally, but it is worth noting that especially countries that are disadvantaged in global politics should not be denied the opportunity to actively participate in this important chapter. To this end, opportunities for meaningful participation must go hand in hand with the digital transformation of administration and government services: The public provisioning of information (both Open Data and government information), the development of public interest solutions and democratic legitimacy are all connected. Governments need to think about Open Data long-term, and adjust their workflows and processes so that publishing Open Data is not a work-intense afterthought but something that is factored into the regular day-to-day workflows. Only through sustained, long-term Open Data efforts can the potentials of Open Data be realized and an ecosystem of civil society and commercial actors meaningfully engage with these outputs.

A better understanding through more research

We also see the need for more research to deepen our collective understanding of the role, potentials, challenges and benefits of Openness. As our interviewees highlighted, the value of (and value-creation through) Openness outside of software development is still under-documented and not understood well enough. We explicitly strive to take an expansive and inclusive perspective on Openness and believe that it goes far beyond its software origins. However, we see the need to much more deeply explore the complex interactions between technology and society that transcend the historic dualistic distinction between digital and analog/physical. In areas where Openness and (technical or institutional) infrastructures intersect, we need a better understanding of the implications of often volunteer-driven work on aspects like security and resilience, both in terms of technology and governance. Finally, referring back to the paragraph above, funding models for most areas of Openness (other than software development) are under-developed and poorly understood. For an area as important as Openness, this urgently warrants a deeper exploration.

Addressing power & markets

Openness should embrace its political dimension

Openness as a concept is inherently antitrust and against monopolies, its mode of production is participatory and aims to facilitate learning, collaboration and innovation. Not few advocates of Openness would argue that the concept is an alternative to the capitalist mode of production. Historically, the hope and assumption of the Open movement was that more Openness would automatically level the playing field and reduce power imbalances through mechanisms like transparency and decentralization. This has not reliably and consistently materialized. In contrast, powerful companies have successfully monetized on the ideas of sharing (private data for targeting) and Openness (public data for AI training).

Public institutions have not yet grasped the potential of Openness for better services, higher welfare or more just societies. Openness as such does not automatically lead to better outcomes. Actors of Openness need to actively define their purposes and implement actions accordingly. Consider an example from Open Source software: One of its biggest advantages for the public sector is that it reduces vendor lock-in. In this context, Openness means a better defense against price hikes and long-term dependence. From an antitrust perspective it means that new competitors can more easily enter the field; also smaller or local companies might be able to enter the market and to offer products and customize those. In the example of public sector software procurement: To bring power dynamics into focus more clearly, this debate should be reframed from a moral to an antitrust argument and connected to the larger purpose of public sector price resilience.

In public procurement guidelines, interoperability of products and services could be added as a necessary condition in order to create a larger ecosystem of services and to prevent lock-in effects. Intellectual property rights and patent law needs to be liberalized in order to allow for more innovation and collaboration instead of "freezing" innovation behind walls. The case of Open Source Software has shown - at least in the layer of software libraries and frameworks - that innovation and success on the economic market can be reached with Openness.

This will require a renewed and deepened understanding of the political sphere and current developments: Openness exists at the intersections of a number of areas that are highly political and contested, and it seems unlikely that this is going to change in the short or medium term. For example, where social networks used to be considered — in broad strokes — neutral, that is broadly not the case anymore. Social network policies have been moving from preventing hate speech towards doubling down on even the most extreme free speech since Twitter was bought by Musk, and since Meta changed its content moderation procedures in the wake of the recent US elections.

From geopolitics and national security to platform accountability, from content moderation to AI regulation, Openness is part of many large political and societal discourses — sometimes more, sometimes less explicitly. Advocates of Openness need to be ready and willing to get involved in fights that are potentially politically charged, which is likely to take many of the organizations in this space outside their comfort zones.

Curtail monopolies and other forms of market domination

The levels of power and market concentration are detrimental to the internet and to societies at large, and they directly prevent any Openness from realizing its potential. As such they should be curtailed heavily. This leads us to a set of straightforward suggestions.

Antitrust regulation and enforcement should be strengthened across the board. This includes mechanisms like stricter rules for acquisitions and mergers as well as stronger enforcement of these rules, mandated interoperability as well as mandated data and network graph portability and access to research data. Digital platforms like Social Media and, quite likely, AI companies follow a winner-takes-all market dynamic. Network effects mean that whoever has the users attracts more users and collects more data to improve services: it is a self-reinforcing dynamic that means that competitive moats tend to grow ever more.

Most of the companies we see dominate the internet today, scaled based on behavioral tracking and online advertising. Behavioral tracking should be severely limited. Given the degree to which today's monopolies and duopolies are based on behavioral tracking, it is imperative to weaken this mechanism in order to open up opportunities for competition going forward. There should be stricter limits on where and how behavioral tracking can be used, especially in the contexts of advertisement, social media, algorithmic content dissemination, search and discovery. Ideally, there should be no tracking allowed beyond any website or app.

In general, regulatory frameworks need strong enforcement. Even in areas where strong regulation exists for tech platforms, enforcement tends to be comparatively weak. Strong and effective enforcement is essential.

Conclusion

We learned that the term Openness is used less explicitly. At the same time, Openness is quite possibly more relevant than ever: The concept has been truly mainstreamed, and it has become an important aspect of geopolitics. This leads to a somewhat paradoxical situation where Openness is simultaneously very important, but has low mobilizing power.

We propose embracing this new situation and, as outlined above, to rethink Openness, to strengthen its foundations as well as to address problematic power and market consolidation. Concretely, we propose considering Openness not as a goal in itself but as a means to an end. Based on our conversations and keeping in mind how Openness might best interface with current political and societal discourses, we suggest this purpose to be either the Public Interest and/or the strengthening of democracy. Previous blind spots need to be examined, like the relationship that Openness has with power dynamics. A useful lens for that purpose is that of commons, consent and coloniality. We also see the need to actively defend Openness against political and economic capture with regulation, taxes and sanctions but also in that we invest in strong Open ecosystems as possible alternatives. Openness still has much to offer going forward.

List of experts

- Renata Ávila, CEO, Open Knowledge Foundation
- Markus Beckedahl, Senior Expert Digital Policy, Founder of netzpolitik.org and re:publica
- Nicole Ebber, Director Governance & Movement Relations, Wikimedia Germany
- Layla Fetic, Senior Expert in Tech Governance and Digital Policy
- Sonja Fischbauer, President of the Board, Wikimedia Austria
- Lea Gimpel, Director AI and Country Engagement, Digital Public Goods Alliance
- Anna-Lena von Hodenberg, Co-Founder and CEO, HateAid
- Simon Höher, Independent strategist, Systems Change Lead at Dark Matter Labs
- Isabel Hou, Secretary General, Taiwan AI Academy
- Mallory Knodel, Executive Director, Social Web Foundation
- Fiona Krakenbürger, Co-Initiator and CTO, Sovereign Tech Agency
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- Matthias Spielkamp, Co-Founder and Executive Director, AlgorithmWatch
- Audrey Tang, Cyber Ambassador of Taiwan
- Tara Tarakiyee, FOSS Technologist, Sovereign Tech Agency
- Alek Tarkowski, Director of Strategy, Open Future
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About the authors

Henriette Litta is Managing Director of the Open Knowledge Foundation Germany. The organisation was founded in 2011 with the goals to strengthen digital sovereignty of citizens, to enable democratic participation and to support an ethical approach to technology for the common good. Among other things, OKF is running Germany's only open source fund for software prototypes (the *Prototype Fund*), has created Germany's most comprehensive coding program for young people (*Jugend hackt*), and is heading Europe's most influential freedom of information platform (*FragDenStaat*). OKF's work focuses on the topics Transparency, Civic Tech and Open Education and is part of a global network of Open Knowledge organizations. Henriette regularly serves on diverse advisory boards of governments and civil society organizations in the field of digital transformation. She studied political science in Berlin, Philadelphia and Singapore.

Peter Bihr is a senior advisor at the intersections of tech, policy, public interest & philanthropy. Working with philanthropic foundations, non-profits and public sector, his focus is on how emerging technologies can benefit society. The through-line of his career has been to understand and shape how digital technology changes power dynamics, and to strengthen democracy and digital rights. In addition to working as a consultant, Peter served as Interim Director for the European AI & Society Fund. He served as special advisor to Stiftung Mercator's Center for Digital Society. Peter co-founded ThingsCon e.V., a non-profit that advocates for responsible Internet of Things practices and was Executive Director of the independent consultancy The Waving Cat GmbH. His projects, ideas and antics have been featured in Forbes, the New York Times, SPIEGEL, The Guardian, ZDF, ZEIT and many other publications. His work has been shown at London Design Festival, the Victoria and Albert Museum, and Fuori Salone. He blogs at thewavingcat.com.

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