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Rethinking European media infrastructures: *Workshop report*

By Corinne Cath, Agustin Ferrari Braun, Seda Gürses, Thijmen van Gend

Disclaimer

This report is produced as part of AlgoSoc, a collaborative 10-year research program on public values in the algorithmic society which is funded by the Dutch Ministry of Education, Culture and Science (OCW) as part of its Gravitation programme (project number 024.005.017). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of OCW or those of the AlgoSoc consortium as a whole.

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Public Values in the Algorithmic Society (AlgoSoc)

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AI, media and democracy

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Introduction

On June 20th, 2025, the AlgoSoc Consortium; the AI, Media, and Democracy Lab; ARTICLE 19; and the Amsterdam School for Cultural Analysis convened a one-day workshop at the University of Amsterdam. We came together to examine the current state and potential futures of media infrastructures in Europe. The event brought together 26 leading voices from academia, industry, civil society, media, and policy spheres, offering participants the opportunity to engage with leading research and industrial practitioners while co-creating policy proposals to shape the future of the field.

This report synthesises the workshop's discussions, findings, and recommendations, providing a foundation for ongoing efforts to build media infrastructures that serve public values and democratic discourse.

The media's infrastructural challenge

The way we think about digital infrastructures has undergone significant transformation over the past two decades, with profound reverberations throughout the media sector. Some of these consequences are well-known and researched, especially regarding the control of platforms such as Google or Meta over consumption and distribution of media content (Nieborg & Poell, 2018; Plantin et al., 2018). Yet, as we noticed during the workshop, some key questions around the media and especially the production of news, like those regarding the key role of cloud computing in shaping the media industry's enterprise software and by extension how it operates (Narayan 2022; Bertulfo & Gürses, 2026, Balayn & Gürses 2024), are not yet sufficiently understood.

What we do know is that some of these infrastructural shifts are not good for the media industry's resiliency (Gürses & van Hoboken 2019; Chander & Gürses 2024; Cath 2025; Ferrari Braun & Cath, 2026). Media organisations face heightened dependencies on a handful of corporate infrastructure providers, creating vulnerabilities in software and hardware architectures while introducing structural changes that create institutional and market volatility. Freedom of information and speech powered by reputable and independent media is crucial to preserving public values, including democracy itself. Addressing the challenges posed by contemporary infrastructural developments is therefore not merely a technical question but an urgent democratic imperative.

Recent European legislations—including the Digital Services Act (DSA), the Digital Markets Act (DMA), the European Media Freedom Act (EMFA), and the AI Act—are charting regulatory responses. However, these frameworks fall short of fully addressing the structures of content production and distribution underpinning media creation. A more ambitious approach is required, one that learns from critiques of previous digital policies while avoiding overreach that could compromise journalistic freedom and media independence. Balancing these imperatives may not be easy, but it is necessary.

A workshop focused on media production?

When we designed this workshop, our aim was to maintain a rigorous focus on the production side of media — specifically, how computational infrastructure (as defined by the Programmable Infrastructure Project[1] as cloud plus

1 Programmable Infrastructures Project is based at Delft University of Technology. More information can be found here: https://www.tudelft.nl/tbm/onze-faculteit/afdelingen/multi-actor-systems/onderzoek/projects/programmable-infrastructures-project

end devices) shapes organisational operations, technical capacities, and the editorial autonomy of media organisations. However, as the day progressed, we observed a telling shift in the collective conversation. Despite our best efforts to center production infrastructure (cloud computing, enterprise software, operational and financial restructuring, and dependencies), discussions repeatedly gravitated toward issues such as content distribution, audience reach, and the influence of social media platforms on our media ecosystem.

This "slippage" from production to consumption is itself diagnostic. It reveals how thoroughly platform studies and distribution concerns dominate scholarly and industry discourse. By contrast, the infrastructural transformation of media production operations remains comparatively underexamined. The difficulty even expert practitioners face in sustaining focus on media production infrastructures, and in asking the hard questions about alternatives to current digital service providers, underscores why cross-disciplinary conversations among journalists, media scholars, computer scientists, policymakers, and civil society organisations are essential. These distinct perspectives are needed not only to diagnose the problem but to imagine, and build, alternatives that serve public values rather than concentrating power to redefine media production in the hands of a few corporations.

When we set out the aims for this workshop, we had aimed to focus on doing a full day exploration of the production side of the media industry, by considering how it entangled itself in computational infrastructure. We started the workshop by focusing on this production question, through three related talks:

Dr. Seda Gürses (TU Delft): Introduction to Computational Infrastructures: the production view

Geert-Jan Bogaerts (VPRO; Public Spaces): The Public Spaces Alliance and VPRO's experience inventorying their digital service providers

Dr. Charis Papaevangelou: Digital infrastructure as a vector of power in the news media ecosystem

The first morning session established that computational infrastructure, particularly cloud computing, represents more than technical modernisation. Gürses demonstrated how the shift from product to service-based software fundamentally restructures the relationship between vendors and media companies, allowing the prior to drive the transformation of institutional operations (e.g., operations spanning from accounting to broadcasting) within computational infrastructures whilst experimenting with underlying economic logics. Bogaerts illustrated how these dynamics play out in public broadcasting, showing both the promise and challenges of building alternatives rooted in public values. Papaevangelou provided concrete evidence of "media environment capture" (Sevignani et al. 2025) showing how seemingly innocuous decisions by media organisations, such as adopting a Content Management System (CMS), transforms them into "tenants" in Big Tech's ecosystems. Together, these talks revealed the production infrastructure challenge: media organisations face intense pressure to "lift-and-shift" operations to cloud platforms, driven by promises of agility and economic flexibility, but in doing so they cede control over the technical, economic, and organisational foundations of their work.

We then expanded beyond immediate production concerns to examine both industry responses and policy frameworks. The format for these discussions was two speakers presented their case studies, followed by extensive discussion with the participants.

Willem Vermost (VRT, EBU): The Dynamic Media Infrastructure, an EBU proposal for sustainable media infrastructure

Dr. Nora van Ingersleben-Seip (RegulAIte, UvA): The EuroStack, Europe's technological ambitions and challenges

Vermost presented the "Dynamic Media Facility", revealing how public broadcasters are attempting to navigate computational infrastructures while maintaining autonomy through technical architectures and open standards. Van Ingersleben-Seip examined the EuroStack initiative, providing crucial historical context about previous failed attempts at digital sovereignty in Europe and raising critical questions about what "success" would mean for such initiatives today.

The afternoon discussions surfaced persistent tensions: between technical solutions and political-economic realities, between European autonomy and global collaboration, between the urgency of building alternatives and the difficulty of funding them. Notably, as predicted by the morning's diagnostic work, conversations repeatedly shifted from production infrastructure (cloud platforms, enterprise software, subscription models) toward more familiar territory of media consumption and distribution infrastructure (social media platforms, content distribution, audience reach and ad-based ecosystems). This gravitational pull toward media consumption and distribution, even among experts explicitly focused on production, demonstrates how thoroughly platform governance studies frameworks have shaped the field's conceptual vocabulary.

It also reveals a gap: we lack sufficiently developed theoretical frameworks and practical strategies for addressing computational infrastructures' transformation of media production operations. The afternoon sessions made clear that while responses like the EuroStack are necessary, they are insufficient without complementary work on economic models, governance structures, and coalition-building that can sustain alternatives to current tech oligopolies.

Purpose and structure of this report

This workshop report aspires to be more than a synthesis of discussions. It represents an analytical intervention into what Ferrari Braun (2025) terms "the media's infrastructural problem", and issues a call to the field: scholars, practitioners, and policymakers studying media infrastructures must expand their theoretical frameworks and methodological toolkits. As recent scholarship by Bertulfo and Gürses (2026) demonstrates, platform studies often conflate cloud computing with platforms more broadly, interpreting cloud companies' power through existing theoretical frameworks rather than providing grounded accounts of their distinct forms of techno-economic influence.

This conflation risks missing how cloud computing companies, which increasingly render end-devices as their extensions for software production (van Gend et al. 2024), wield infrastructural power differently than social media platforms, not primarily through data extraction, algorithmic manipulation, and ad revenue, but by entrenching evolving models of software production native to computational infrastructures deep within the operational fabric of client organisations. This fundamentally links how software is produced, maintained, and governed to the competitiveness of these organisations in markets. Narayan (2022, 2023) has called for treating cloud computing as a distinct object of inquiry within platform studies. Bertulfo and Gürses conducted a micro-historical analysis showing some of the origins of clouds in how companies like Salesforce incrementally displaced traditional enterprise software models. Building on this work, we argue that understanding media's infrastructural transformation requires multiple analytical approaches.

These include insights from science and technology studies (STS), ethnographies of the computing industry, and market studies examining sociotechnical market-making practices. Industry genealogies are particularly valuable for revealing the historical processes behind today's configurations. Poon, for example, demonstrates how technological arrangements necessary for modern consumer credit emerged through contested and contingent processes rather than through inevitable technological progress (Poon 2007, Poon 2012). Only by deploying these diverse analytical approaches can we adequately theorise the specific mechanisms through which cloud computing companies are reshaping media production and identify the points of intervention where alternatives might be funded, built, and imagined.

This document proceeds in three parts. First, we introduce the conversation in the morning, where we examine the fundamental shifts in software production that contributed to the business of computing's shift from product-oriented to service-centric models, the latter being the production model native to current computational infrastructures (cloud plus end-devices as their accessories), a model with great impact on media production. We then look at an example that demonstrates how adopting this shift is restructuring media production and creating new forms of business relations that depend on and extend computational infrastructures. We then explore industry responses, including both market-driven adaptations and emerging alternatives rooted in public interest values through the lens of journalistic practice, as well as academic research. In the second part, we cover the technical and policy responses to our earlier diagnosis, through two extended case studies. We examine how public service broadcasters are attempting to navigate computational dependencies through technical architecture initiatives like the Dynamic Media Facility, revealing both the sophistication of these efforts and their limitations within existing economic constraints. We then analyse policy frameworks, particularly the EuroStack initiative, contextualising current European sovereignty ambitions within the history of previous regulatory failures and examining contested questions about terminology (sovereignty versus autonomy), feasibility, international implications, and what Europe might learn from global peers like Brazil and India. In the final part, we recap the discussions and add our analysis of it. We conclude by providing an analysis of the discussions that help frame what is next for the future of European media infrastructures.

About this report

This workshop report emerged from the collective expertise and collaborative work of workshop participants. It represents shared analysis and recommendations developed through dialogue across disciplinary, sectoral, and national boundaries. While individual contributors emphasised different dimensions or priorities, the document reflects broad consensus on the urgent need to rethink (European) media infrastructures.

We present this report not as a final blueprint but as a foundation for ongoing conversation and action. The challenges identified here will not be resolved through single policy interventions or technical fixes. They require sustained attention, adequate resourcing, political will, and collaboration among diverse stakeholders committed to preserving and strengthening the democratic functions of media in the digital age. The workshop participants hope this document contributes to building the coalitions, frameworks, and infrastructures necessary for that work.

Software production & computational infrastructure

Talk 1: The transformation of software: *From product to service* by Dr. Seda Gürses

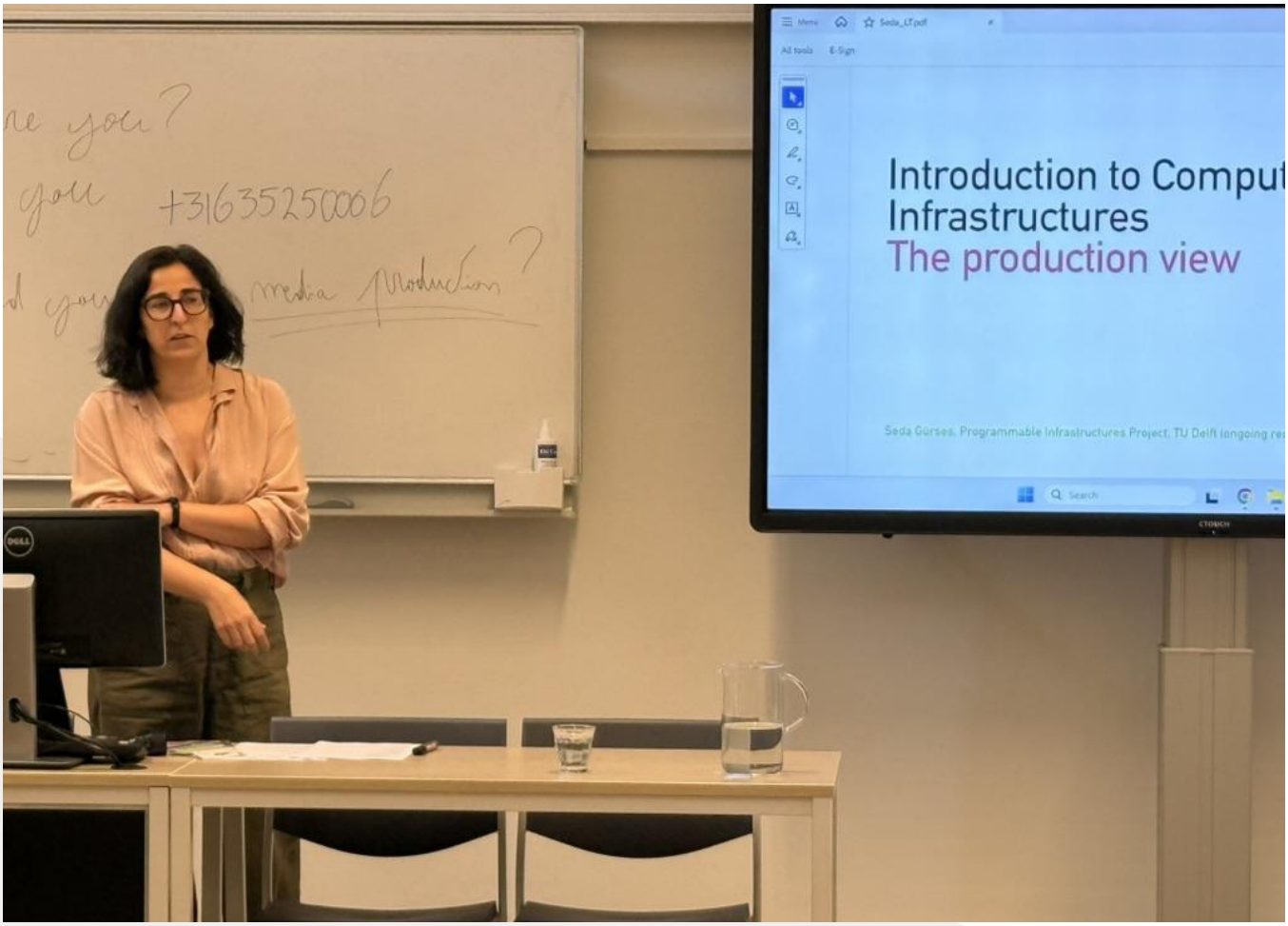
The morning session opened with an exploration of how software production has fundamentally transformed over the past four decades. Software once came packaged as physical products, CDs, DVDs, diskettes[2], exchanged through one-time transactions between companies like Microsoft and consumers. Today, software arrives as continuously updated services and apps, with (silent) 'over-the-air' updates occurring automatically, often without user awareness (Gürses & van Hoboken, 2018).

This shift represents more than a change in distribution method. The personal computer revolution of the 1980s, famously championed by Steve Jobs as liberation from "Big Brother" IBM[3], promised individual empowerment through personal control of machines. That promise is inverting: today's devices function less as tools of personal liberation and more as extensions to the cloud infrastructure.

Source: 1984 Apple McIntosh commercial https://www.youtube.com/watch?v=VtvjbmoDx-I

2 https://www.lenovo.com/us/en/glossary/floppy-disk/

3 As most famously captured in the MacIntosh ad for the superbowl that drew on Orwel's 1984 novel Apple 1984 Super Bowl Commercial Introducing Macintosh Computer (HD)



Understanding the cloud: *Beyond "someone else's computer"*

The session addressed the popular notion that "there is no cloud, it is just someone else's computer." While this captures the cloud's materiality, massive data centres consuming substantial natural resources and energy, it fundamentally understates what has occurred. The cloud is not merely distributed computing infrastructure; it has become a "software production environment" (Balayn & Gürses, 2024), a computational environment where software and conditions of software production are continuously developed, deployed, and refined.

This transformation accelerated through the 2000s as software development methodologies evolved. The Department of Defense's "waterfall model" gave way to "agile methodologies" (Gürses & van Hoboken 2019), which emphasised customer-centricity and responsiveness. "DevOps"[4] practices in software development enabled continuous integration and delivery, allowing companies to push features, gather user feedback, and iterate rapidly. End devices, like our phones, laptops, and other media devices like speakers, became integrated into this production cycle, vessels for delivering services and integrating mechanisms for gathering data ("telemetry") to continuously improve production.[5]

4 https://www.atlassian.com/devops

5 Thereby collapsing the functional difference between software consumption and production, however the details of this development are beyond the scope of this workshop report and can be found here: Gürses, S., & van Hoboken, J. (2018). Privacy after the Agile Turn. In E. Selinger, J. Polonetsky, & O. Tene (Eds.), *The Cambridge Handbook of Consumer Privacy* (pp. 579–601). Cambridge University Press.

Four companies now dominate this landscape, of what Gürses calls "computational infrastructure, which are made up of clouds and end-devices": Microsoft, Amazon, and Google control public cloud infrastructure (variously called cloud, hyperscalers, or public cloud), while Google and Apple control the mobile device and web browser ecosystem. The Internet of Things (IoT) remains contested territory, although increasingly managed through services produced in computational infrastructures. This concentration represents a fundamental shift in how computation is organised and controlled. During this first session, the framing brought the cloud side of computational infrastructures into view through how production ofend-devices, like speakers, are transformed and how this impacts media institutions.

The business of computing: *Capturing operations*

Since the 1950s, the business of computing has consistently focused on capturing the operations of other businesses. Early computers calculated missile trajectories; later systems managed billing, invoicing, inventory, and logistics. The business of computing has rarely succeeded purely in consumer markets (B2C), it has thrived, and is thriving, by serving businesses (B2B), helping them optimising operations, as well as connecting with consumers. Yet, the impact of B2B systems on the media, or other critical sectors, seems to have receded to the background of scholarly and also regulatory focus, as computational infrastructure expanded into consumer markets. It is unclear precisely how or why this happened, which is a topic that needs further scholarly attention.

The contemporary shift we are seeing, according to Gürses, when it comes to the impact of cloud on industry is from creating operational efficiency to enabling organisational agility. Cloud providers promise something else than previous international business machine companies did. The cloud no longer simply promises faster billing systems; "they promise to transform entire organisations to be more customer-centric and responsive in turbulent markets". The proposition is straightforward: "lift and shift your business to our cloud infrastructure to become agile". However, as we will see when considering the hypothetical case study introduced by Gürses during the first talk of the day, this agility comes at a price: companies transform their operations and their financials in a way that cedes control to cloud providers and the economic and relational transformations they bring about.

Case study: *The transformation of "Bosos"*

To illustrate these dynamics, Gürses' session presented a fictional company called "Bosos", a high-end speaker manufacturer. In 2005, Bosos sold hardware products with embedded software through traditional retail channels, processing payments through banks. This represented a straightforward business model: design quality hardware, manufacture in Taiwan or China, sell at premium prices (€3,000-5,000), and complete one-time transactions.

By 2023, Bosos had "gone agile." The transformation of the company was comprehensive:

Production changes: The company developed apps for speaker control and customisation, creating close dependencies on Google and Apple's app ecosystems. Digital production moved from largely in-house to Amazon Web Services (AWS), the cloud-subsidiary of Amazon. Amazon's voice assistant "Alexa" was integrated into the Bosos speakers. Distribution expanded from Bosos' distribution channels, brick and mortar stores to include Google's and Apple's app stores for subscription management.

Revenue model transformation: Beyond selling hardware, Bosos now offers premium subscriptions for personalised audio features and hardware upgrade programs. Single transactions gave way to continuous revenue streams, fundamentally changing the company's financial profile and economic considerations. This economic shift is key, as it ties customers into

Fig 2: Slide in Gürses' presentation describing the strategy of the fictional company Bosos.

a long-term economic relationship with the company, while making its revenue streams more attractive to investors with the promise of amore predictable recurring income (Bertulfo & Gürses, 2026, Shapiro 2026).

Payment infrastructure: Managing complex, continuously optimised subscription models required moving most transactions of the company from traditional banks to payment companies like Stripe, which are optimised for software-based subscription experimentation and revenue maximisation.

Organisational restructuring: The company reorganised from product-oriented teams to service-centred functions (hardware, software, services), reflecting its transformation from product manufacturer a provider of services that are bundled with a manufactured device.

Extended dependencies: Bosos speakers now lock consumers into computational infrastructures, Spotify streaming, Amazon services, app store ecosystems. Radio and alternative media consumption patterns (e.g., linear broadcasting models) are displaced. The company invests increasingly in computational infrastructure rather than traditional manufacturing capacity.

All of these (hypothetical) technical transformations come packaged with cloud-wardly economic relations and transformations that redefine which companies hold infrastructural control over how software is produced and how operations are organized. Bosos is but one example of this larger dynamic, by which computational infrastructures and the companies that control them and enact their preferred technologies, economic models, and worldviews upon all who come to rely on them.

The economic transformation and what it means for the media

Gürses argued that this case reveals that cloud adoption is not merely technical infrastructure replacement. Computational infrastructure constitutes a massive "factory" (Ensmenger, 2021) with its own economic model and system, increasingly decoupled from traditional economic structures while using them as underlying infrastructure (e.g., banks becoming

"pipes" for digital payment companies that live on the clouds).

The adoption of cloud is also driven by markets: organisations face economic pressure to become agile, to achieve customer-centricity and responsiveness and to adopt continuous revenue models. This pressure drives them to move production into computational infrastructures controlled by a few companies, fundamentally changing:

- Internal organisational capacity for production
- Production culture and labour relations
- The balance between core products/content and wrapped services
- The networks of preferable suppliers and partners for the company
- Financial systems and accounting practices shaped through computational infrastructures and associated payment companies

The services, wrapped around what were previously products, become central to business activity. For media organisations, this means focusing less on journalists and content production, and more on surrounding services. Continuous revenue streams through subscription models tie production to new payment infrastructures, helping create an alternative economic system that may not serve public values.

Implications and resistance

The vision of computational infrastructure as a revolutionary "alternative" is incomplete and contested. Companies are lifting and shifting to cloud infrastructure, but the transformation remains in progress and is changing rapidly, including in the media sector. This liminal moment, according to Gürses, creates opportunities for different visions of production, infrastructure and societal organisation. The media does not have to acquiesce to the cloud or its implied mode of organising and producing software.

However, building computational alternatives requires more than replacing technical infrastructure, servers, hardware, data centres. Gürses argued that it also requires confronting the alternative economic order these infrastructures are establishing. Creating viable alternatives demands diverse perspectives beyond technical expertise, developing not just infrastructure but a comprehensive vision for how we want to produce things, with what kind of institutions and for what kind of society.

This conversation cannot occur only among technical experts alone, as is now often the case. While technical knowledge is necessary, building alternatives to computational infrastructure monopolies requires broad participation in envisioning and implementing different models of digital production that serve public values rather than concentrating power in a few companies' hands. "It requires conversations like the one we are having here today", said our expert speaker.

The insight that Gürses left us with is the following: "The business of computing captures the operations of other businesses and organisations through the production of software, and pulls on formations of hardware in the process". By extension, she called on us to realise that the phenomena she sketched are not dynamics that can be answered by drawing on the existing theoretical frameworks of platform studies alone. Rather, the power of the cloud computing companies that provide their infrastructure to the media for news production, is distinct from the power of social media companies for news consumption and distribution.

This last insight provided a good and accidental bridge to our next speaker, who picked up on the problem space of social media capture and its role in the news media ecosystem. In the process, we lost part of the initial focus on production but were able to collectively consider and discuss the opportunities and limitations of building social media in the public interest.

Talk 2: From theory to practice, public media's infrastructural awakening by Geert-Jan Bogaerts

Following the deep dive into computational infrastructure and production, Geert-Jan Bogaerts discussed how infrastructural transformations have played out in journalism and public broadcasting in the Netherlands. He is the head of innovation and digital media at the Dutch public broadcaster VPRO, and the initiator and chairman of Public Spaces, a coalition of public institutions seeking to reduce our collective dependency on Big Tech.

The internet's broken promise

Bogaerts began his career as a correspondent and editor for the *Volkskrant*, working in the economics section before moving to Brussels in 1995. During those years, a new technology emerged that promised to revolutionise journalism: "the internet." It was going to "completely change how we operate", he recalled, not just how journalists did research or produced stories but also how they engaged with their audiences. He said that at least in the beginning, it felt like they had new means to tell news stories.

At the time, hardly anyone discussed commercial infrastructures or the advanced topics that would later dominate conversations about Big Tech. The internet was more or less seen as a free-for-all, a means to democratise media production. It also meant that for many people the sector felt more equitable, as the advent of technology meant anyone could make media. By 2003, intrigued by these possibilities, Bogaerts joined the *Volkskrant*'s editorial staff to think systematically about how journalism would change due to the internet and digitisation. The prevailing conclusion then was modest, he recalled. They saw digitisation as changing the media's distribution, not so much its core production processes.

This assessment has proven dramatically insufficient. Today's "AI-driven transformation influences the entire production cycle, from conceptualisation to production to audience interaction". Like Gürses, Bogaerts argued that the entry of cloud infrastructures and companies into the media sector are a "much more fundamental revolution than simply the digital one". They both highlight the importance of understanding the impact of digital infrastructures of news production, rather than (just) its consumption.

Reclaiming public values and building public spaces

Bogaerts' career led him from the *Volkskrant* to freelancing and eventually to the VPRO in 2014, a Dutch public broadcaster with a long history of experimentation with emerging technologies, Virtual Reality, Augmented Reality, wearables, while raising public awareness about their implications. This critical approach to technology led to deeper thinking about Big Tech's dominance at the VPRO. In the mid-2010s, amid Trump's first election, Brexit, Cambridge Analytica revelations, and pervasive narratives about disinformation and privacy violations, Bogaerts read an article by Ethan Zuckerman (2018), then at MIT University.

Zuckerman drew an analogy between today's internet and the ether frequencies of 100 years ago. When governments decided to regulate ether frequencies in many European countries, that was the start of public broadcasting systems, Bogaerts explained. In his eyes, now it's not frequencies that are scarce, but attention, the attention people pay to the media. Zuckerman saw an argument for public broadcasters, especially in Europe, to engage in a "battle" with Big Tech to reclaim the public values that should underpin their work. As head of VPRO's innovation and digital department, Bogaerts took this work on and spoke to Zuckerman.

This conversation sparked the creation of Public Spaces, a coalition-building network of civil society parties working together to reclaim

public values on the internet. Easier said than done, according to Bogaerts. Building a manifesto and raising awareness was not the hard part. The hard part was operationalising it. What can we do? How can we do that? What does it mean to reinsert public values in the online domain? After two to three years of research and discussions, Public Spaces[6] developed the "digital powerwash"[7], a tool initially created internally but now extended for use by other organisations.

The concept is straightforward: If you want to improve the world, you have to start with yourself. The digital powerwash aims to raise awareness within participating organisations about the tools they use and their implications. The digital powerwash is a structured questionnaire enabling organisations to inventory their digital instruments and make better-informed choices, not based solely on traditional factors like features and price, but also on adherence to public values. For analytics, the tool prompts questions like: What analysis do you do with that data? Are there alternatives you can use instead of giving all audience data to Google, tools that accomplish the same goals with greater regard for privacy? Opening up the space for alternatives to big tech.

Rethinking public media's purpose

Looking toward the future of public service media, Bogaerts raised fundamental questions currently under discussion at VPRO: Is content actually the purpose of the media's existence? Do we need to think about other roles for public media, for example, playing a role in bringing society back together, creating common ground for public debate?

Given the extensive splintering of contemporary Dutch society, he argued, if that is the media's role, then the content we make is no longer the purpose but a means for discussion, interaction, and audience engagement. This reframing has clear implications for the media's reliance on social media for news consumption and its production, "Do we still want to use Facebook, Instagram, TikTok?" Bogaerts asked rhetorically, He argued there is a need for civic social media based on public values that safeguard public privacy, not optimised for attention, using algorithms that are not optimised for retention and click-through rates but for public engagement and meaningful discussion.

This vision of "completely different social media" is now being developed collaboratively with multiple academic parties. VPRO is working to establish a civic social media lab with the Amsterdam University of Applied Sciences (HVA) to create a structured approach to the new social media ecosystem public broadcasters need. Public Spaces is still starting, Bogaerts concluded, but the direction is clear: public media organisations must move beyond content creation alone to become active builders of infrastructure that embodies and protects democratic values in the digital sphere. The answer that Bogaerts provides is one that responds to the problems raised by platform studies scholars regarding the impact of social media platforms on news consumption, and to a lesser extent production.

It is important to note, that already early on in the workshop we see a shift from a heavy focus on enterprise software production, to social media platforms and news consumption. This shift in focus was also reflected in the Q&A that followed:

Discussion: *what does it mean to build alternatives to Big Tech?*

Bogaerts' presentation sparked extensive discussion about the practical challenges of building civic alternatives to commercial social media platforms.

6 https://www.vpro.nl/info/vpro-x-publicspaces
7 https://english.publicspaces.net/project/the-publicspaces-digital-powerwash/

On adoption challenges, a participant noted the difficulty of convincing people to use civic social media, particularly around algorithmic recommendation systems. Bogaerts identified three critical success factors for alternative social media platforms: access to exclusive content that people are willing to seek out; access to a long tail of diverse content geared toward different audiences; and access to audiences themselves. "Within the public media ecosystem, all three success factors exist," he argued, "but we have to make use of them in a focused way."

On infrastructure dependencies, another participant drew the discussion back to the earlier theoretical framework: even civic social media solutions must run on cloud infrastructure and end devices, raising questions about whether alternatives can truly escape GAFAM's (Google, Apple, Facebook, Amazon, Microsoft) grasp. Bogaerts acknowledged this fundamental challenge, emphasising the need to connect with Eurostack initiatives while warning against simply replacing American with European, which doesn't automatically solve all our problems if it's not based on public values.

On regulatory asymmetries, a non-Dutch participant highlighted the uneven regulatory landscape. Newspapers face liability for reader letters they publish; social media platforms face far less accountability for content they distribute. It is not enough to install some alternative, she argued. According to her there is also a need to break down the monopolies and regulate for a level playing field, which doesn't exist at the moment.

Bogaerts agreed while expressing measured scepticism about the future of global social media platforms. He thought the time of the worldwide social media platform is at an end. They are declining in terms of popularity. Zuckerberg himself said they're not social media anymore, their platforms are not for interaction among like-minded people but for distribution and promotion instead.

Bogaerts vision centres on broadcasters moderating their own online communities to foster engagement around specific issues. This approach, he suggested, complements rather than replaces broader regulation of Big Tech.

On economic incentives, discussion turned to the cost advantages driving organisations toward Big Tech platforms. One participant noted that companies transition partly because cloud providers offer cost-efficient approaches with attractive pricing. If this is an economic incentive, how can we think of incentives to support alternatives? Do we need state economic incentives to support use of other services?

The question prompted reflection on whether public broadcasting's mandate should expand beyond content production to explicitly include providing infrastructure for public debate, and what role the state should play in supporting such infrastructure as a public good. This economic dimension, how to fund alternatives when commercial social media platforms can subsidise services through surveillance capitalism, remained a persistent challenge throughout the workshop discussions.

These are important challenges. At the same time, there was an underlying tension between the discussions around infrastructure and the ones regarding social media. While they were not necessarily conflated, it is clear that most of the field feels more at home in the latter than in the former. For example, the prevalence of "surveillance capitalism" (Zuboff, 2019) as a business model for platform companies does not map onto the business model of cloud computing. Far from a contingent blind spot, these tensions and complexities are a feature of a system purposefully designed to blur its boundaries and obfuscate its functioning. As the first talk emphasised, the economic capture operates at a deeper level than social media alone: by embedding themselves into organisational operations, cloud platform providers shape how companies function in the image of their own economic interests (Chander and Gürses 2024),

making the news production question inseparable from broader questions of infrastructural autonomy in the media sector. So too did the question of scope: given that production requirements vary substantially across sportscasting, radio, and print, should a public infrastructure alternative seek to match the full range of services commercial cloud providers offer, or is a more targeted mandate both more feasible and more defensible?

This latter focus and conclusion of the Q&A section provided a strong bridge to the third speaker of the morning session.

Talk 3: Media environment capture: *The case of news organisations* by Dr. Charis Papaevangelou

Papaevangelou brought the discussion's focus on news media organisations, drawing on his research on platform regulation, governance, and the relationships between platform firms and news organisations. His intervention emphasised a crucial point raised in the introduction: beyond purely technical issues and questions, lies the dimension of power dynamics stemming from digital capitalism's political economy and, particularly, its implications for our media information environment.

Defining media environment capture

Papaevangelou framed media production as "the organisation of labour and technology in ways that enable the creation of value by actors like news media organisations and publics within broader structures." This production is not limited to traditional systems of ownership and governance that shape media as a whole. Today, it increasingly involves CMS, AI-integrated cloud services, and other computational infrastructures embedded across what was described earlier as journalism's entire value chain. Much like Bogaerts before him, Papaevangelou stressed that the effects of AI adoption by news companies are more radical than previous digital transformations.

Our speaker started by asking, why care about infrastructure? In the context of changing computational infrastructures and ongoing digitalisation, journalism is being organised in ways that maximise effectiveness toward the broader ordering logic of revenue generation, particularly in the case of for-profit media. As organisations, news outlets face unavoidable pressure to constantly adjust their infrastructure in the pursuit of value maximisation, further integrating increasingly agile, modular computational infrastructure into their production processes.

Yet "stepping back to consider journalism's normative objectives reveals a fundamental tension", according to our speaker. Journalism's purpose is not simply to produce information but rather to fulfil a normative ideal, to structure the conditions for public deliberation and political life.

The term "media environment capture" (Sevignani et al. 2025) describes how economic ordering logic and infrastructure reshape not only the production environment but also, subsequently, citizens' capacity to participate in the public sphere, a Habermasian conceptualisation of journalism's democratic function.

The state of play: *news organisations and AI partnerships*

The current landscape shows accelerating integration between news organisations and AI/cloud providers. Major partnerships proliferate: *The New York Times* with Amazon, *The Guardian* with OpenAI, Prisa Media with Perplexity.

An AI Partnership Tracker[8] now monitors this expanding web of connections, collaborations, and in some cases, effective mergers between news organisations, large firms, and AI technology providers.

Case study: *ArcXP and Le Parisien*

Papaevangelou focused on a particularly revealing example: ArcXP[9], a CMS developed by *The Washington Post* (itself owned by Jeff Bezos), running entirely on Amazon Web Services (AWS). In February 2024, French newspaper *Le Parisien* adopted ArcXP, essentially moving its entire content production infrastructure into the Amazon ecosystem.

The AWS architecture of news production

Papaevangelou presented a diagram illustrating how ArcXP's ordering logic embeds itself into news media production workflows (fig. 3). On the left side, a user (for example, an editor) issues a request: "I have a huge audio file, please transcribe it and highlight keywords." This request goes into a load balancer, a technical component, but significantly, one with its own governance logic. From there, the request enters AWS's Elastic Container Service. Depending on the prompt, different AWS services activate. Transcriptions, keywords, and other outputs are stored in an S3 bucket, Amazon's cloud storage service. Other reports and events are stored in different containers and modules within AWS infrastructure.

8 See https://petebrown.quarto.pub/pnp-ai-partnerships/ Tow Center for Digital Journalism's Peter Brown (last updated in Feb 2025)

9 https://www.arcxp.com/

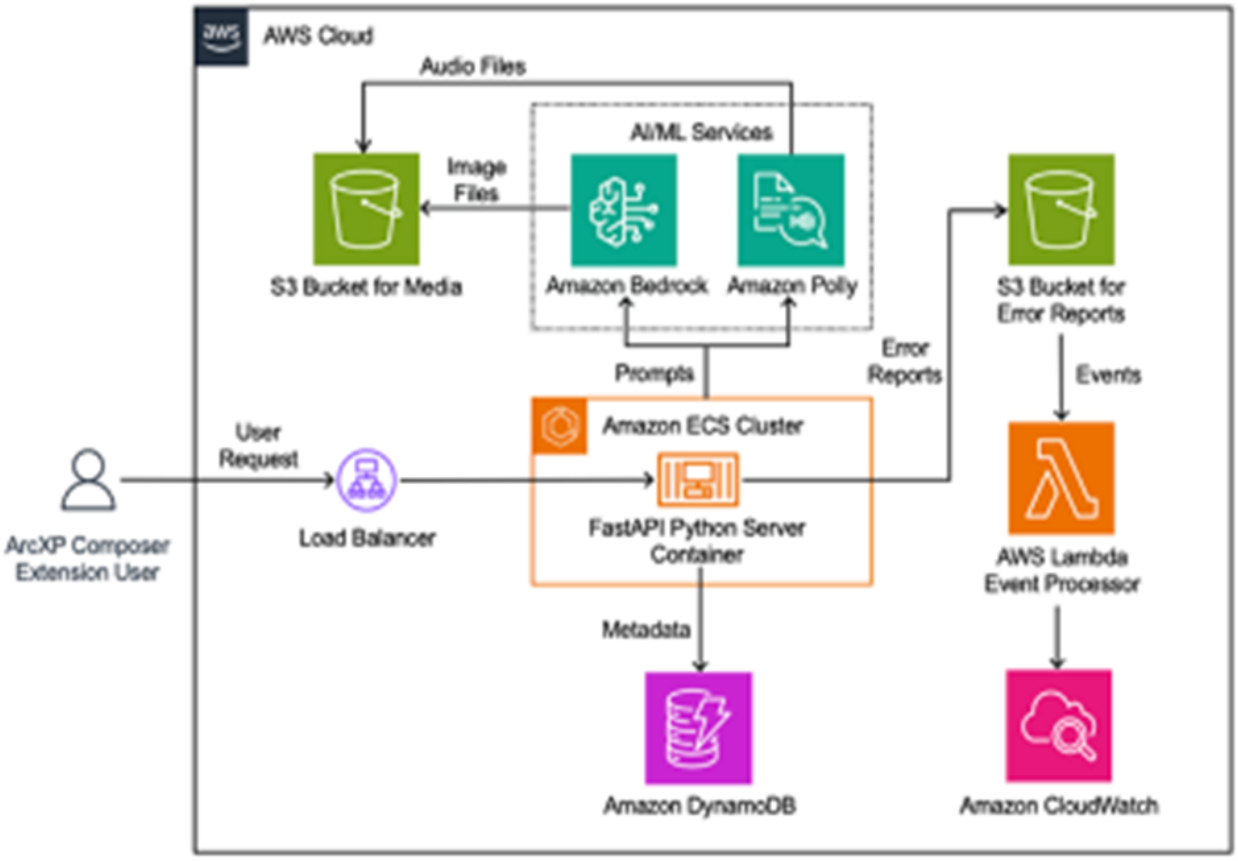


Fig. 3: High-level architecture of ArcXP presented by Dr. Papaevangelou (source: https://aws.amazon.com/fr/blogs/media/arc-xp-leverages-generative-ai-to-enhance-journalism-with-aws/)

The conclusion is stark: Instead of controlling their infrastructure and optimising their workflow according to their editorial values and practices, news organisations like *Le Parisien* are optimising for the architecture and pipelines of proprietary cloud stacks, like that of AWS. This represents one of the most concrete examples of the transformation taking place in the news media sector, a shift from owning and controlling production infrastructure to renting capacity, that is, becoming tenants within systems designed and governed by Big Tech companies.

Implications for journalistic autonomy

This case does crystallise broader concerns raised throughout the workshop morning's session. It demonstrates the practical mechanics of media environment capture: news organisations don't simply adopt new tools; they relocate their entire production processes into infrastructures with embedded economic logics and governance structures beyond their control. What exactly those logics and governance structures are–or even what counts as infrastructure (social media platforms or cloud platforms) is disputed by the various speakers.

Papaevangelou argued this dynamic also reveals how material infrastructure (Amazon's data centre network) creates path dependencies that make alternatives increasingly difficult. The computational power required for AI-driven tools and agile software production creates barriers to entry that favour existing cloud oligopolies. His talk also argued that news organisations become implicated in narratives that may run counter to journalistic scrutiny and critical inquiry. By way of illustration, Papaevangelou referred to the partnership announcement between the *New York*

Times and Amazon, where executives of the latter's "Artificial General Intelligence" (AGI) research team said how "data licensed from *The Times* could help fuel the efforts of Amazon's A.G.I. lab"[10]. By adopting these systems and, indirectly buying into the accompanying narratives, they become stakeholders in their providers' commercial success, a relationship that potentially compromises editorial independence not through direct interference but through structural alignment.

Discussion: *Pluriformity, power, and paths forward*

We see a theme cropping up across the three first speakers: the media sector is moving its operations to the cloud platforms of global market leaders AWS, Microsoft, and Google. Likely, to the detriment of their ability to keep vital control over their operations, and by extension of the protection of their public mandate (Cath, 2025; Cath, 2026). We know that the growing reliance of media production on computational infrastructures represents a fundamental shift in the relationship between news organisations and their operations infrastructure, one with profound implications for journalistic autonomy, institutional capacity, and ultimately, the democratic functions of journalism. Yet, as the three speakers pointed out in their own ways, we are still lacking a comprehensive vocabulary to articulate the transformation wrought by computational infrastructures. Without a clear and shared conceptual framework to address this question, providing an alternative vision to the current paradigm becomes very hard.

Papaevangelou's presentation sparked a robust debate about the relationship between media concentration, technological infrastructure, and possibilities for alternatives.

On pluriformity and scale, one participant noted a troubling synchronicity between monopolisation efforts in the media sector, the emergence of large conglomerates, and Big Tech's infrastructure dominance. From the perspective of media plurality, particularly in the already hyper-concentrated Dutch context, this convergence poses fundamental challenges. "Innovation in journalism, even in how it uses technology, often comes from micro- or smaller-scale media. That's where challenges to the system emerge" according to one veteran of the media industry. However, as the participant noted, smaller media is disappearing in a context dominated by industry giants.

The concern extended to how infrastructural choices foreclose this innovation space. "One of the problems I have with *The Washington Post* or *The New York Times* adopting these systems is that it creates superstructures that cannot be challenged anymore. Where is pluriformity?", said another participant. The question applies equally to alternative infrastructure projects: "You look at alternative tech solutions, great. Eurostack is a huge challenge to the American monopoly, but you need several distributed solutions at different levels, allowing also for these minor challenges to come," a third remarked.

On journalistic experience and market pressures, another participant asked about journalists' actual experience using ArcXP. Papaevangelou acknowledged this as an area requiring further research, noting he had seen no reporting from Le Parisien on how they navigate the system. But he emphasised the broader context: "They are being pressured into buying into AI hype, or AI tech stack implementation, whatever you call it, by broader market forces. Precisely to avoid being left behind, and at the same time signalling to the market that they're following examples set by industry leaders."

10 Available at: https://www.nytimes.com/2025/05/29/business/media/new-york-times-amazon-ai-licensing.html.

This dynamic exacerbates asymmetry between large and smaller media companies, leaving less room for smaller organisations to engage in innovation projects. The issue of venture capital came up, which flows into projects that promise more return on investment. Drawing the discussion back to the need for different economic models for tech.

On the complicity of large media organisations, a participant who had worked at a big American media outlet described witnessing a strategic shift from attempting independence from Big Tech to forming alliances instead. "The way the media landscape works is winner-takes-all. As a large media property, you have to do these things. You constantly optimise for search, social, retention, app store... No small media can compete with that."

The scale of this effort is revealing: the teams working on platforms had 36 people, larger than most newsrooms. This creates direct complicity between big media and Big Tech in perpetuating the system. While agreeing that much innovation comes from smaller structures, he warned: "These on their own, in this environment, will not persist long. They will be acquired by larger media or run into the ground by the Big Tech environment."

Some participants argued that to remedy this problem we needed to develop a serious "Eurostack" and the governance model to support it. Media-governed social media, alliances of small organisations working together to shape the rules according to which they think the system should work, multiple participants argued.

On regulatory resistance and ideological capture, the discussion took a troubling turn when one participant recounted a conversation with legal counsel at a big media outlet at a recent conference. "To my astonishment, she was saying that the DSA and EU attempts to regulate social media were, in her mind, censorship, and she would fight them." This revealed a geopolitical problem not yet brought to the fore: "If the biggest media organisation in the world, with the biggest influence, is siding with preposterous Anglo-Saxon jungle-capitalism views, then we have a problem of capturing the debate because they are very influential."

This observation underscored twin necessities: alternatives are essential, but without regulation, creating an alternative environment that can stand on its own becomes extremely difficult. Yet the ideological alignment of influential media organisations with Big Tech positions complicates efforts to build, or fund, alternatives and ensure they are properly governed.

On collective bargaining and funding models, a funder supporting numerous small non-profit media organisations raised a practical concern about the AI partnership deals: Even if small media somehow manage to collectively bargain, would they not still get pennies on the dollar from a deal? Is this an effort that should even be tried at all, or should we go for alternatives? Was one question that was put to the group.

This prompted reflection on different strategic orientations for confronting computational infrastructure concentration:

1. **Challenge directly**: Resist these companies through infrastructure alternatives;
2. **Strategic alliances**: Drawing on empirical work showing "befriending the giant" as a survival strategy for smaller organisations;
3. **Build alternatives**: Create parallel systems embodying different values;
4. **Transitional infrastructure**: Not alternative or direct challenge, but working with the assumption of system collapse, exploring steps toward what comes after a failing system burns itself out.

Each approach carries different assumptions about power, change, and possibility.

On locating the problem precisely, the discussion concluded with crucial analytical questions: Where exactly does the problem lie? Is the move to cloud infrastructure per se the problem? Or is it the agile forms of production that accompany cloud adoption? Or is the problem that cloud infrastructure is controlled by a few companies? Or how these companies manage their infrastructures?

One participant pushed back on the framing: "When you are telling the story from infrastructure, you are saying let's forget about markets and all that, for a moment. But when you are talking about moving to an alternative system, how do we think about that without thinking about economics?" A lot of what keeps things in place are market relations and very strong economic interests that stakeholders have in the way the current system is organised.

These questions crystallise the workshop's central tension: Another system might make infrastructural sense, but what would the economic and political implications of such a system be? Questions regarding the funding, construction, and imagination of alternative visions to our current paradigm would resurface throughout the day, suggesting it represents not a question to be answered but a problematic to be continually engaged.

After these three lightning talks and the discussion it led to, we had a quick coffee break enjoying the sun-filled terrace in the middle of Amsterdam, before moving to the first of two extended case studies of the day.

Case Study #1 Industry response: *The dynamic media facility and the push for agility*

Presented by Willem Vermost (VRT, EBU)

Willem Vermost from the European Broadcasting Union (EBU) shifted the discussion from diagnosis to industry response, presenting the Dynamic Media Facility[11], a technical architecture initiative attempting to help public service media navigate the computational infrastructure landscape while maintaining some degree of autonomy. His presentation revealed both the pressures driving broadcasters toward cloud platforms, and emerzging efforts to create alternatives. In so doing, it also illustrated how deeply the logic of agility has infused broadcasting infrastructure thinking.

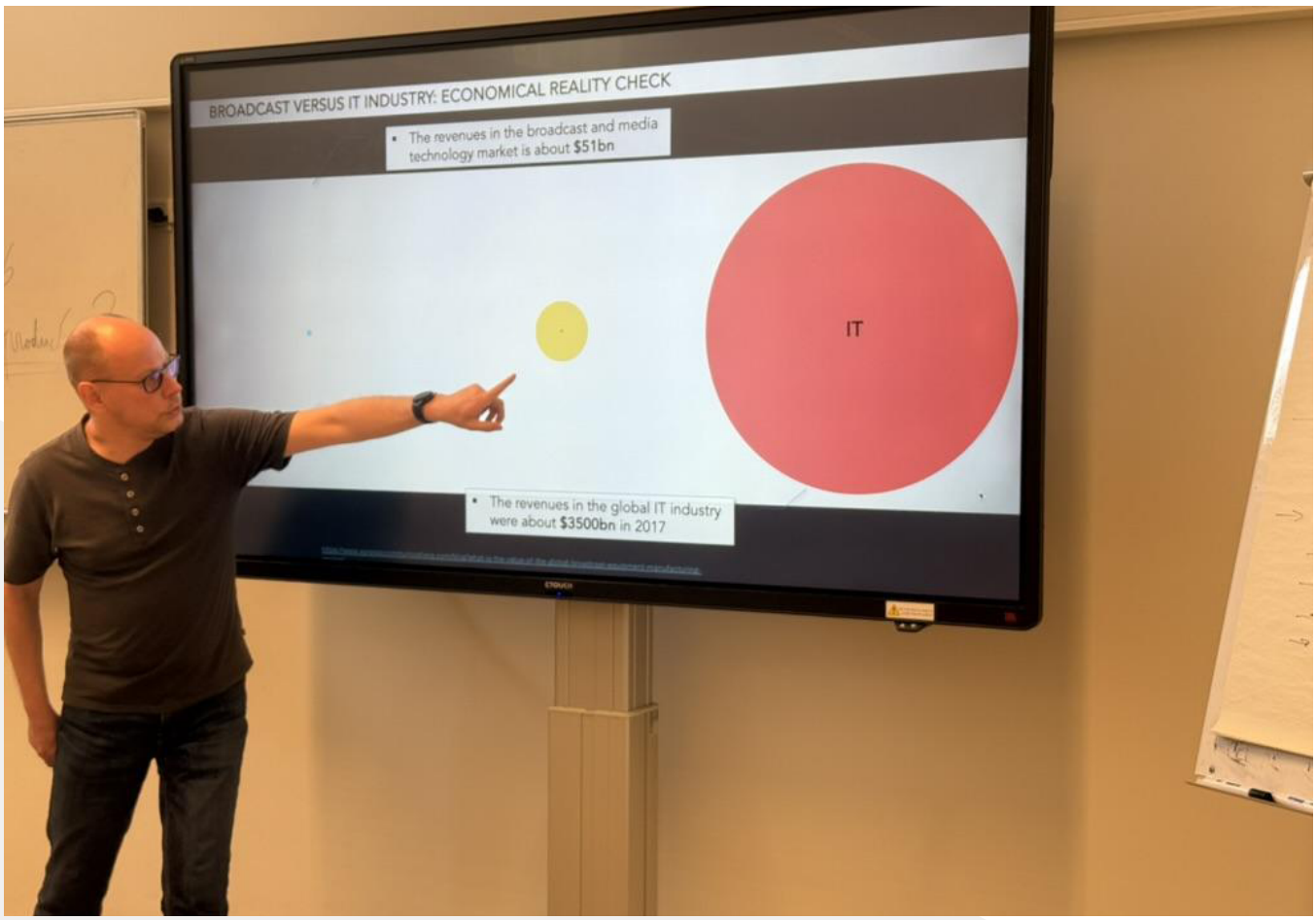
The EBU represents 113 member organisations across 166 languages, extending beyond Europe to include Canada, Japan, and South Korea. Vermost framed the challenge facing these members starkly: "Staying trusted and, most importantly, connected with our audience." For many years, reaching audiences was simple and affordable with one standardised method: antenna, signal, broadcast. Think of broadcasting radio over AM and FM, or linear television transmitted on a fixed schedule to households tuning in at a set hour: a single distribution channel, a predictable audience, and infrastructure that broadcasters themselves owned and controlled.

The issue, now, is that the audience is everywhere and EBU members need to reach them on every platform. Audiences listen via streaming apps on their phones during commutes, watch on-demand on smart TVs and laptops, encounter clips on social media feeds, and increasingly access content through voice assistants and connected devices, each with its own technical requirements, recommendation logics, and commercial intermediaries sitting between broadcaster and listener. This shift requires a different value proposition.

However, implementing these changes imposes massive new costs. EBU members created numerous on-demand platforms, modelled after Netflix and Spotify, that sought to reach citizens directly on their phones, smart TVs, and tablets. These represent entirely new departments that had not existed before, with "hundreds of developers creating a platform". The budget implications were severe. The media industry had to shift more of its budget toward the distribution side of our media process to meet the challenges of digital transformation, but the budget did not grow. No one got more funding from the government.

Fixed or declining public funding combined with rising costs, wages, infrastructure, distribution platforms, created intense pressure on the production side of broadcasting operations. The question that leadership asked was: If a big chunk of the budget shifted to distribution, how can we optimise production?

11 https://tech.ebu.ch/groups/dmf



The optimisation imperative: *Behaviour, bricks, and bytes*

Vermost outlined three optimisation strategies broadcasters pursued:

Behaviour: Optimise staff efficiency. Reducing task-specific expertise among the technical staff and privileging multi-skilling. Such a move paired nicely with the offer of computational infrastructures providers, who encourage companies to outsource their technical expertise to them (e.g. for managing hardware) and focus on their core activities (by developing and deploying services within their cloud environments).

Bricks: Optimise studio space and time. They looked in depth at the optimisation of studio space: a TV studio used for one hour a day is not a good use of resources, so instead they develop studio areas that are not exclusively tied to a single program.

Bytes: Optimise technical resources. Equipment like EVS slow-motion services represents expensive capital investments purchased for major events like the Olympics but then sitting underutilised or even unused for four years. Could these resources be shared or virtualised?

The IT industry shift: *Market realities*

The move from specialised broadcast boxes to IT industry solutions required confronting market realities. Already back in 2017, the broadcast and media technology market represented approximately $51 billion, which paled in comparison to the $3.5 trillion of the IT industry. Logically, start-ups and SMEs decided to focus on the global IT industry, rather than on the broadcast/media tech market.

Market asymmetry shaped technological development. Broadcast-specific solutions received far less investment than general IT infrastruc-

ture, making IT adoption both economically rational and technologically inevitable. This, in turn, pushed the media industry away from its own infrastructure to that of the giant cloud providers.

Yet, despite the focus on IT-solutions, technical capabilities evolved dramatically. In 1995-2000, coaxial cables carried single video streams using Serial Digital Interface (SDI) technology. By 2020, 800 gigabit interfaces could transport 8,900 uncompressed HD streams on a single cable instead of one stream per cable. This 64-fold increase in switching capacity made IT-based media production theoretically feasible.

From specialised hardware to dematerialised facilities

In 2012, EBU began seriously considering shifting from proprietary broadcast technology into IT infrastructure. A 2016 proof of concept experimented with IT-based equipment, "the same boxes, but another connector at the back, connected to the IT network" is how Vermost explained it. Around this time, EBU asked producers what they expected from technology departments. The answer: flexibility, scalability, shareability.

Flexibility: Moving from standard definition to HD television traditionally took a year of ripping out equipment and cables. But in the internet age, YouTube offers HD, SD, 4K, 720p "just with a click." IP networks are agnostic, whatever content is transported, the technology can handle it without bespoke solutions.

Scalability: Traditional broadcast houses faced fixed capacity limits. "If you buy a matrix, you spec your switch for X signals and it is already full" Vermost explained. IT infrastructure must scale to support the global internet. A modern IT switch, just two rack units high, can switch over 45,000 video streams in production format.

Shareability: Compute power can be shared across multiple studios or bundled when needed. "We don't need to put a track just for the Olympics" that sits idle for four years. If compute power can be shared without requiring specific expensive servers, shareability becomes a key component of moving into IT infrastructure.

This transition brings new concerns, security and reliability, as broadcasters move from bespoke to "dematerialised" technology. This case study highlighted the trade-off initially sketched in the morning by Gürses between abstraction and control over your operations, but now in the context of media production.

The bandwidth bottleneck and the cloud problem

The vision of cloud-based facilities using standard internet protocols (RFCs) rather than proprietary formats seemed logical, but it faced a critical obstacle: bandwidth. A single HD video stream requires 2 gigabits per second. As Vermost explained, "You cannot send this from your premises to the cloud. You will be spending all your money on your telco bill, and that's it." This bandwidth constraint meant that fully cloud-based production remained impractical, requiring a hybrid model combining on-premises infrastructure with selective cloud use.

The operational expenditure trap

Moving toward software also means transforming financial models from capital expenditure (CapEx) to operational expenditure (OpEx). Traditional broadcast equipment might last 12-15 years, like cars: entailing high investment costs and long write-off periods. IT equipment, by contrast, becomes obsolete or unsupported within 3-5 years; if it is even purchased and maintained in-house in the first place.

More significantly, software requires continuous maintenance and updates. "Once you start to pay, it doesn't stop anymore, think Adobe." Code without maintenance will rot, security flaws emerge, dependencies break, compatibility issues multiply. Echoing Gürses earlier remarks, Vermost stressed that the business mod-

el of software production has changed from one of purchase of a product to a recurring payment to a software company that provides you the software as a service. This continuous cost is justified by the promise of agility and responsiveness, but also means that once you're in the realm of IT, you are in. Like Hotel California, you can check out but you can never leave.

This shift from one-time purchases to perpetual subscriptions fundamentally alters organisational economics. Broadcasters become perpetual subscribers rather than owners of their production infrastructure.

The Dynamic Media Facility: *Architecture for agility*

Despite these challenges, Vermost argues broadcasters must continue moving from circuit-based to packet-based networks for media applications. By 2022, the SDI-to-IP transition seemed largely "done" for many European broadcasters building new facilities to replace aging infrastructure from the 1960s.

However, the COVID-19 Pandemic catalysed another shift. "We spent a lot of time on how we can produce media remotely. We produced events completely in the cloud, 12 people on their laptops at home." Low quality perhaps, but it demonstrated possibilities for moving "further into the realm of software."

Contemporary evolution in switch fabrics, CPU technology, and GPU capabilities made software-based production increasingly viable. Smart network interface cards (NICs) could offload processing from server CPUs, expanding capabilities while reducing power consumption. This enabled thinking about infrastructure differently, not as heterogeneous "pets"[12] requiring individual care but as uniform "cattle" that could be replaced when underperforming. The IT industry's abstraction layers allow treating infrastructure as fungible resources rather than unique assets. Again, abstraction comes up as a key frame through which to understand the impact of the cloud on media production.

The container revolution: *Kubernetes for broadcasting*

The breakthrough involved containerisation, particularly Kubernetes. Kubernetes is an open-source system that automates how software applications are deployed, scaled, and managed across many machines, originally developed by Google and now maintained as a community standard. Instead of purchasing expensive VMware licenses (which tripled or quadrupled after Broadcom's acquisition), broadcasters could potentially use Kubernetes frameworks to deploy media functions as orchestrated containers. The vision: build a graph of software media functions on the fly. "Agility. Becoming agile in your infrastructure", as Vermost said.

Vermost described VRT's implementation: A compute cluster used as visual radio for Radio 1 in the morning; in the midst of day it becomes infrastructure for a TV show; and in the evening for sign language and kids' channels. Those are just three servers. Adaptable infrastructure enables efficiency, the promise motivating the movement from media-specific into IT infrastructure. This approach offers sustainability benefits, according to the speaker: "In the night, we usually don't produce. So in the middle of the night, we can use it for other workflows, creating subtitles, transcriptions etc." When production needs extend beyond on-premises capacity, external compute resources can be accessed based on what the BBC calls a "spectrum of latency", different workloads tolerating different delays.

12 The pets versus cattle metaphor is often used to explain how IT departments approach their hardware https://www.hava.io/blog/cattle-vs-pets-devops-explained

The reference architecture: *Abstracting cloud dependency*

The Dynamic Media Facility Reference Architecture structures this vision in three layers:

Layer 1: Container-based IT infrastructure. Media people do not touch this part at all, the IT industry provides it wholesale. They are much bigger and the media does not need to invest there, according to Vermost.

Layer 2: Media-specific functions. Industry-specific capabilities for media processing, with standardised exchange mechanisms between functions. Examples include receiving contribution streams, converting formats, mixing video and audio, processing audio, and rendering graphics.

Layer 3: Cross-cutting concerns. Governance, security, monitoring, and management capabilities spanning the system.

Vermost's critical intervention focuses on Layer 2, the media exchange layer. The common problem moving into this realm is exchanging media, people running containers with functions but needing to get media out of the network. By standardising media exchange, Vermost relieves vendors of creating their own solutions and eliminates interoperability issues. The exchange is solved.

Most significantly, the architecture aims to abstract away cloud provider dependencies. And this, according to Vermost, is very much on purpose: "Media functions should not even know whether we are working on one or two compute nodes or whatever. Abstracting away whether it is just memory in local compute or other cloud providers. If we can abstract this, we can run any type of compute on any cloud provider, making us independent from AWS, on-premises, or someone else's computer." Yet as Gürses cautioned earlier in the workshop, abstraction is a double-edged tool: while it promises portability and independence at the technical level, it also entrenches the broader shift from ownership to running services in other companies' environments and economic logics. The very layer that makes broadcasters formally provider-agnostic also normalises their continued dependence on their infrastructure providers.

Global collaboration and open source

Recognising that EBU alone would face some resistance from North American vendors, the initiative partnered with NABA (North American Broadcasters Association) to create global scope. The approach centres on open-source, multi-vendor solutions managed through the Linux Foundation. "We are not software providers", the goal is creating standards and frameworks, not proprietary products.

Participants include numerous broadcasting agencies plus vendor partners, notably including Nvidia, whose presence Vermost acknowledged with irony: "Nvidia is like a virus in data centres." Results emerged quickly. The Media Exchange Layer (MXL) project launched just seven months after initial discussions, with working code already transporting media between Docker containers. A GitHub repository hosts ongoing development.

The sovereignty question: *Seeking European alternatives*

Vermost concluded with broader concerns about technological sovereignty. "Are we, public service media, worried? Yes."

At a recent technical assembly, one member announced intentions to move to European cloud providers, specifically targeting moving at least 50% away from AWS to reduce risk concentration. This prompted investigation: What are the European possibilities? How many cloud providers, alternatives are there in Europe? Examples include Scaleway (collaborating with France Télévision) and StackIT (Germany, operated by Schwarz Group, which provides cloud infrastructure for Lidl stores' inventory management and AI systems).

EBU even announced collaboration with Nvidia on "sovereign AI" infrastructure, though Vermost admitted that there is nothing particular in this announcement, no promise whatsoever beyond trying to "tickle AWS, Microsoft, those guys". Apparently, those cloud companies answered the provocation by "trying to lure us in with their European offers (which are still not fully European)."[13] Most tellingly he said that the EBU is creating a cloud strategy group, aiming to create a united front of public service media in this area. Vermost concluded his presentation by calling on the audience to support these efforts.

Taken together, these developments illustrate the cascading organisational changes that computational infrastructure imposes on public service media. First came the work of building new capabilities to reach audiences on new technologies and platforms, with all the staffing and budgetary pressures that entailed. Then came the work of navigating the web of these technologies through abstraction and interoperability layers, because wielding them all simultaneously had become too complex to manage directly. Now comes a third layer of work: navigating the providers of those technologies from a "sovereignty" perspective, coordinating across organisations, building bargaining power, and attempting to carve out room for European alternatives within a market shaped by a small number of dominant firms. Each phase is adding new institutional demands without displacing the previous ones, leaving public broadcasters managing an ever-thicker "stack" of dependencies and the political relationships that come with them.

Analysis: *Agility's seductions and constraints*

Vermost's presentation embodied the tensions running through the workshop. On one hand, it demonstrated sophisticated technical thinking about broadcaster autonomy: the reference architecture's abstraction layers genuinely aims to reduce cloud provider lock-in. The emphasis on open source, multi-vendor standards, and European alternatives reflects awareness of sovereignty concerns.

On the other hand, the entire framework operates within the logic of agility critiqued in the morning session. The "optimisation" framing, behaviour, bricks, bytes, accepts austerity's premise: public funding won't increase, so production must become more efficient. Multi-skilling replaces specialised expertise. Studios must run continuously. Equipment must be fungible cattle rather than carefully maintained pets.

The vocabulary is revealing: flexibility, scalability, shareability, adaptability, efficiency, sustainability. These are precisely the terms computational infrastructure providers use to sell cloud services. The Dynamic Media Facility represents broadcasters adopting IT industry's operational logic while attempting to maintain some infrastructure control. Most significantly, the economic model shifts from ownership to service-for-a-fee, from CapEx to OpEx, mirroring the transformations described by both Gürses and Papaevangelou. Even if abstraction layers reduce dependence on specific providers, broadcasters become perpetual subscribers to software systems requiring continuous maintenance, updates, and payments.

The sovereignty discussion reveals another bind: European alternatives exist but remain marginal. The announcement with Nvidia carries no substantive commitments but aims to create negotiation leverage with AWS and Microsoft. The cloud strategy group starts from nothing. It is necessary, but the question is how its solutions can ever be sufficient, in the face of the enormity of the infrastructural power exerted by cloud computing companies. This highlights the workshop's recurring challenge: technical solutions alone cannot address political-economic problems. The Dynamic Media Fa-

13 https://www.theregister.com/2025/07/25/microsoft_admits_it_cannot_guarantee/

cility may provide more flexible infrastructure, but it cannot resolve the fundamental tension between public service media's democratic mission and the commercial logics embedded in computational infrastructure, whether American or European.

Discussion: *Infrastructure, economics, and public values in media production*

Following Vermost's presentation, Agustin Ferrari Braun opened the floor for discussion around three core questions: How does this infrastructure shift shape media production? Is this approach sustainable? And is wider political support for internet infrastructure necessary? The subsequent discussion lasted over an hour and touched on many different topics. For simplicity's sake, we have thematically summarised the debates around three themes: distribution and production, platforms, and infrastructures.

The economic squeeze: *distribution vs. production*

The discussion was opened by a participant noting that news organisations are spending more on distribution while production budgets shrink, questioning what drives this change in the context of the internet's zero marginal costs and how this relates to cloud infrastructure dependency. Vermost confirmed the stark reality, arguing that the shift towards delivery necessarily meant less resources for the rest of the media chain.

This tension was further addressed by a third participant. "The system is always the same, you have to economise because budgets are shrinking, always at the expense of content." He described eliminating the sound engineer position at an outlet he used to work at: "The broadcast team went from three people to two. Sound quality was worse and production value decreased, but we could maintain the same amount of programming annually. We were constantly hollowing out content."

However, there are important qualitative differences between the historical precedent and the current paradigm. Crucially, distribution channels used to be owned and governed by the media. These structures were in turn subjected to a series of obligations to preserve pluralism, such as the kiosk's obligations to sell all newspapers. As a participant noted, media law has not adapted to the development of new distributional logics, which means that we have lost crucial mechanisms to regulate the public sphere in the process.

The Platformisation of Journalism

These discussions about distribution and production were complemented by different perspectives on the "platformisation of journalism" (Poell et al., 2022). Expert participants shared their experiences adapting their practices to the affordances of digital platforms. These included writing stories in styles that were "overdriven and dramatic" to reach audiences, having editorial agendas marked by whether something has traction on X (formerly Twitter), or ditching local journalism for at-risk communities and instead produce English-language content that is more easily monetizable. At the same time, another participant noted that media companies often argue that they "need to be where the audience is" which "kills all discussion about moving away from big platforms".

This discussion also touched upon GenAI and what attitude public media should adopt towards it. AI and large language models are new cultural technologies that mediate access to information. However, their deployment has led to a concentration of power that cannot be undone through open-sourcing, due to the massive infrastructural requirements needed to deploy these technologies at scale. Moreover, the development of these models was based on a "complete reappropriation of the entire global information commons", combined with a collection and repackaging of user data.

Building on these experiences, one participant argued against a fatalist approach to dimin-

ishing budgets. Public interest information requires more money. At a time where producing low-quality content with little to no public interest is easier than ever, it is necessary to spend more money on public interest alternatives. Turning the traditional narrative on its head, they argued that not doing so is the unrealistic position.

Their call was echoed by several others, who stressed the importance of producing public interest information that is not driven by market or technological imperatives. Returning to the normative ideals of journalism, evoked earlier by Papaevangelou, it is crucial to remember that the media has a democratic mission, which should inform its relationship to the different market forces shaping its development.

It is worth noting that the GenAI conversations throughout the day tended to centre on the consumer side: people asking ChatGPT a question instead of searching for a news article, or being served a generated answer at the top of Google rather than a link to a publication. The production-side dimensions of GenAI, its use in sports broadcasting and analysis, for instance, as discussed in Papaevangelou's presentation, received less sustained attention from the room. This itself is illustrative of the broader shift documented across the workshop: even when the topic explicitly concerns media production, the gravitational pull of public debate keeps returning to questions of distribution and audience-facing tools, rather than infrastructural power or media production.

Infrastructural power

Moving onto the specific dynamics of the infrastructure, one participant noted an underlying tension in the Dynamic Media Facility project. On the one hand, the EBU is trying to gain control through this initiative, which would allow them to define public values in their technical ecosystem. However, by relying on hyperscaler clouds to implement this system, it ultimately is losing control over how these questions are defined. It is a question of money, more than technology.

Another participant expanded on this perspective, warning against the separation between content and infrastructure. For example, cloud providers might push for more bandwidth and quality, which is not a demand of the industry or the public per se. Behind cloud providers' promise to handle the infrastructure, lies their power to define the field and which actors can intervene in it. For example, as one participant noted: "when you think of AI as a way cloud providers evolve the production environment, with Nvidia playing an important role, you are moving to multi-clouds running services together. Nvidia is on top of that game. So now, good luck not doing AI". A third participant remarked that there is a potential for separation between infrastructure and content, but it does not happen magically. The infrastructure has to be governed by the people who use it. It is not a property of technology and you cannot trust technologists to do it right.

Moreover, we also discussed an issue that is often taken for granted: the underlying devices. As a participant pointed out, it is becoming increasingly hard to make money from hardware. Predictions say companies like Walmart will buy screens and give them away, subsidised by advertising. This would further distance public media companies from the public, while continuing to entrench a dynamic where the more popular a program is, the more the broadcaster has to pay to diffuse it.

Considering all of these challenges, it is crucial to question whether our present infrastructure will continue to be around in a decade or two. If we think of alternatives, we need 20 to 30-year visions not based on 'we need to give AI to kids' or 'we need the most clicks,' but what is the vision for a future with or without devices, with different economic outcomes than services as the main mode. These questions are difficult to ask because we are so busy with what's right in front of us.

And with this grand call, we adjourned for lunch.

Case study #2: *The EuroStack, Europe's intellectual response*

Presented by Dr. Nora van Ingersleben-Seip (RegulAIte, UvA)

Van Ingersleben-Seip approached the debate about the "media's infrastructural problem" (Ferrari Braun, 2025) by introducing the debate about the "EuroStack". Van Ingersleben-Seip's post-doctoral research examines Europe's ambitions to build an end-to-end EU technology stack, from critical resources and raw materials through chips, cloud infrastructure, and applications. Focusing on the EuroStack offered another way to consider the impact of computational infrastructures on media production, looking at political rather than technical approaches.

Historical context: *A missed opportunity?*

The EuroStack initiative(s), launched in early 2025, was one Europe's think-tanks response to growing geopolitical concerns about reliance on American infrastructure. Several proposals have used the name EuroStack to broadly describe a digital infrastructural development project seeking to establish European independence from foreign technology companies (e.g. Bria et al., 2025; Caffarra et al., 2025; Zenner et al., 2025).

However, this is not a new discussion. While "digital sovereignty" only gained traction around 2019, similar concerns existed in the early 2000s. Even in that previous timeframe digital sovereignty was a double-edged sword. On the one hand, it was used by Russia, Iran, China and others to limit global information flows and the open internet. On the other hand, it was used to try to promote approaches to open standards, which sometimes reflected the loftier ambitions of the open source community, but was used as a tool to defend the corporate interests of American and European companies (Russell, 2014).

Van Ingersleben-Seip's research into open software promotion in the EU shows that concerns about dependence on American companies, specifically Microsoft, were raised by open source advocates, think tanks, and civil servants within the European Commission. A crucial moment came in 2004 with the European Interoperability Framework (EIF). The first EIF contained something extraordinary: a preference for open source software and open standards in public IT procurement, with open standards defined so that standard patents could not be monetised. This would have impacted the approximately €50 billion procurement budget at the time.

However, when the EIF was updated in 2007, that preference was removed. The second model promoted "business model neutrality", governments could buy whatever software they wanted. The open standards definition was lost. This made it easy for institutions to stay with existing systems like Microsoft. As a result, the EU remains hugely dependent on Microsoft and other hyperscalers today. This case study opened a policy window into some of the business dynamics sketched in the morning session, showing how the computing industry and attempts to regulate it co-evolved over time. Specifically, it demonstrates how the tech industry was able to capture the regulatory process early on, resulting in the domination of American giants in the EU market.

Van Ingersleben-Seip noted that lobbying was

not just from American big tech, however. EU companies like Philips, Nokia, and Ericsson, with large patent portfolios, also lobbied against the broad definition of open standards, worried about monetisation. This made it harder for policymakers to argue that their provision supported EU industry. The EIF was further diluted in 2010, a critical date as the cloud computing industry was growing rapidly amidst the Global Financial Crisis.

Critical questions for the EuroStack: *break out groups*

Van Ingersleben-Seip asked the participations to break into smaller groups and discuss the following questions, regarding the regulation of digital infrastructure companies:

1. **What is different this time?** There is more political momentum, but is it enough given past failures?

2. **What is missing from the current conversation?** The EuroStack emphasises security, competitiveness, and European values, but what about sustainability and democratic accountability? "We can't have it all," van Ingersleben-Seip noted. The German debate about rolling back environmental regulations because companies can't compete exemplifies these tensions.
3. **How realistic is this initiative?** Critical voices say Europe does not have the technology; hopeful perspectives say the technology and people exist but need opportunity. "The truth is probably somewhere in between," van Ingersleben-Seip suggested. The proposal is pragmatic, acknowledging Europe needs partners. But which partners are we discussing here?
4. **What are the implications for international partners?** This could negatively impact relationships with the US. Microsoft and Amazon now offer questionable "sovereign cloud" offerings. Under trade rules, Europe cannot simply go "full European."
5. **What can Europe learn from global peers?** India and Brazil are making digital sovereignty efforts. IndiaStack has succeeded to some extent but has not eliminated US cloud dependence. Brazil is also still dependent. Tempering expectations is a good thing. Some other countries have tried and success has been mixed.

European Sovereignty?

The discussion was kicked off with a number of people expressing concerns about the scope of the EuroStack and nationalist ideas embedded in the project. Coming from a more global perspective, it feels inward looking, echoing "Fortress Europe" discourses, which can be very harmful from a human rights perspective down the line. Moreover, other digital infrastructure projects, such as the IndiaStack, allow governments to access unprecedented amounts of private data, which can be used against citizens if lacking proper rail guards. However, as a participant noted, people in the Brussels bubble are focused on getting "something underway", but that means that critical questions such as what we mean by sovereignty can get side-lined.

This is particularly important when it comes to discussions about the media. Sovereignty is intrinsically tied to the notion of "raison d'état", the pursuit of national interest by the state. Yet, the media's watchdog role means keeping a critical distance towards the state and operating autonomously from it. A sovereign tech stack could foster new forms of repression against journalists, particularly considering that some of the actors better positioned to spearhead these efforts, such as France, also have a long history of undermining investigative journalism. Under these circumstances, we can wonder whether sovereignty is indeed our aspiration.

The group was divided on this question. On the one hand, people pointed out that non-sover-

eign approaches to infrastructure often work better. When the Spanish electric grid collapsed in 2025, power was restored thanks to a collaboration with other countries such as Morocco and France. We could think about non-sovereign, but autonomous, infrastructures as a goal. At the same time, the notion of sovereignty has the merit of bringing the state to the forefront. A participant noted that it is both more honest, insofar states will necessarily have to play a key role in the development of a new, autonomous, digital infrastructure and highlights the potential dangers of this arrangement, inscribing it in a long history of state development, where journalism played a key role.

While we did not reach a consensus regarding whether or not sovereignty should be a goal, and the implications of describing it as such, this preliminary discussion set the stage for the breakout groups.

Plenary discussion after breakout groups

1. What is different this time?

There was a widespread agreement that building alternative digital infrastructures is becoming an increasingly popular topic of discussion across Europe. The tense geopolitical situation has demonstrated the critical importance of these debates, and there is more willingness to think big. We are also seeing local and municipal levels taking action, like the cities of Amsterdam and Nijmegen moving off Microsoft. As a participant noted, last time these debates were on the table, the focus very much laid on developing open source and open standard software initiatives, this time around there is more space to discuss bigger infrastructural developments. Perhaps the biggest indicator that something is different this time around might be the growing nervousness of Big Tech companies. C-suite executives are multiplying their appearances in European fora and their lobbying efforts seem to have increased considerably across Europe.

Nevertheless, the EU's institutions continue to embrace neoliberal policies that seem poorly-fitted to the development of an ambitious industrial strategy. While the European Parliament is moving on the topic, the Commission remains committed to its strategy of deregulation through "simplification", an approach that disproportionately favours Big Tech companies. On the regulatory front, the dilution of fines to X (formerly Twitter) for violating the Digital Services Act and the delays in the implementation of the AI Act also indicate that the Commission might be willing to compromise to its disadvantage on digital affairs to avoid conflict with Trump's White House.

2. What is missing from the current conversation?

Echoing previous conversations, this discussion point focused on two elements. First, the lack of political willingness - particularly from the European Commission - to commit to an ambitious industrial strategy. While academics, civil society representatives and European businesses seem to be on board with this plan, Brussels has proven to be more reticent. Moving forward with the EuroStack project(s) will either require the Commission to embrace it, or to take them out of the equation and build something in parallel to them.

Focusing on this last point, some participants mentioned the possibility of moving beyond the EuroStack to a wider non-aligned stack. Not only would this address some of the qualms voiced before regarding the "Europe First" undertones of the project, it would also help get more people on board, increasing the chances of success. This sort of transnational discussions are already taking place between developers from different European countries and other places, such as Brazil and India. A non-aligned stack would help formalise them in a political project that could also benefit from the production logics and underlying ideologies of open source software.

3. How realistic is this initiative?

The group discussing this question concluded that everything is possible if you throw enough money at it. The question remains whether the EU decision makers are willing to commit and do what it takes to ensure their independence. One of the key, underdiscussed, strengths of Big Tech companies was their capacity to durably shape imaginations of the internet. As a participant noted, platforms aggregated different services (e.g. search combining UI, relevance engine, and index; social media with storage, indexation, identity) in such ways that policymakers struggle to see them as different services, even though splitting their provision would lead to better governance. The EuroStack can be realistic provided that 1) there is a willingness to strongly back it up, and 2) decision-makers emancipate themselves from received ideas regarding how the provision of digital services ought to be structured.

4. What implications for international partners?

Building on the previous interventions, this group asked whether Europeans are brave enough, and the EU in the necessary position of stability to carry out the development of an independent digital infrastructure. Pulling the plug from US services will both enrage American business interests and, arguably, weaken the EU's bargaining position with them. It would be an unprecedented decoupling between Washington and Brussels. The potential tension resulting from this process needs to be taken into consideration, given that its implications will likely be felt across the continent.

5. What can Europe learn from global peers?

There are approaches to digital infrastructure. The US and China have strong security and defence histories in building stacks. Brazil and India were more about developing vibrant markets. For example, Brazil's digital payment system, PIX, has 200 million users, bigger than Visa and Mastercard combined. ONDC is an abstract framework for commercial transactions. IndiaStack people got in a room, made a protocol, and shipped it. The stacks of Brazil and India derived their legitimacy from building something that works for people in their everyday life, without being big on values or competitiveness. Following their example might require building protocols and having the state scale them, rather than creating national champions. Provide public infrastructures so markets can develop solutions on their own. The lesson is not that technical demonstration substitutes for political and economic reform, earlier sections of this report make clear that it cannot, but that building working alternatives can generate the constituencies and legitimacy needed to sustain such reform. The demo and the memo are complements, not alternatives.

Closing remarks

Agustin Ferrari Braun brought the workshop full circle. Our guiding question for the day was: how do digital environments shape media production? The discussions documented in this report point toward urgent analytical and political work. Understanding media's infrastructural transformation requires moving beyond existing frameworks that treat all platforms as operating through similar logics of data extraction, surveillance capitalism, or algorithmic manipulation.

As the workshop revealed, *cloud computing companies wield power differently, not primarily through content moderation or recommendation systems, but by embedding their software and computational infrastructure deep within the operational fabric of media organisations, fundamentally reconfiguring how production occurs, how labour is organised, and how value is captured* (see also Gürses & van Hoboken 2019; Chander & Gürses 2024; Cath, 2025; Bertulfo & Gürses, 2026).

This distinction matters for both analysis and intervention. The case studies presented, from *Le Parisien's* migration to ArcXP to the EBU's Dynamic Media Facility, demonstrate that media organisations face pressures operating at multiple scales simultaneously: technical architectures that create path dependencies, economic models that transform ownership into perpetual subscription, and operational logics that privilege agility and efficiency over other values. These pressures cannot be adequately theorised through either platform studies or existing legislative frameworks alone.

The field requires, and the workshop provided, expanded analytical toolkits drawing from science and technology studies, ethnographies of the computing industry, market studies examining sociotechnical market-making practices, and (hypothetical) industry genealogies revealing how today's configurations emerged through contested, contingent processes rather than inevitable technological progress. These approaches can help identify the specific mechanisms through which computational infrastructure is reshaping media production, and, crucially, the points of intervention where alternatives might be funded, built, and imagined.

The workshop's final question remains open: *How do we manage alternative systems economically when current infrastructures are sustained by powerful market forces and stakeholder interests aligned with operational capture and dependency lock-in? As the discussions made clear, the power cloud computing companies exert over media organisations operates through different mechanisms than the surveillance-based business models that characterise social media platforms. The workshop brought into view how this happens through infrastructure embedding, subscription dependencies, and the gradual reorganisation of operational practice rather than data extraction alone. Any viable alternative must therefore be designed with these distinct dynamics in mind.* This question cannot be answered through technical architecture alone, nor through policy intervention disconnected from material realities of infrastructure provision. It requires the kind of cross-disciplinary, cross-sectoral collaboration this workshop began to model, bringing together scholars who can theorise power relations, practitioners who understand operational constraints, civil society organisations championing public values, and policymakers with capacity to reshape regulatory and funding environments.

A related question, raised but deliberately left open, concerns the scope of what any public infrastructure alternative should cover. As mentioned, the production requirements for sportscasting, radio, and print journalism differ substantially, and it remains unclear whether a public service alternative should seek to

match the full breadth of what commercial cloud providers offer, or concentrate on a more defined subset. This report does not fix that scope, but the question should inform how these discussions develop going forward, and is worth returning to in any future recommendations or policy work.

The path forward demands not choosing between technical alternatives, regulatory intervention, or new economic models, but recognising these as interdependent dimensions of a broader project: building media infrastructures that serve democratic discourse rather than concentrate power in the hands of a few dominant and heavily financialised firms. This report documents where that work begins.

The organisers wish to thank the speakers and participants who gave their time, expertise, and intellectual generosity to make this workshop possible. Special thanks are due to those who braved these novel questions of media production as well as the Amsterdam waterfront and emerged from the day having been personally targeted by its seagulls, your sacrifice did not go unnoticed.

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