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WORKING PAPER

The Potential of Contextual Advertising Compared with Tracking-based Personalised Advertising

Johanna Graf, Lukas Probst, Lena Steltzner, Leonie Wellmer

GERMANWATCH

Executive Summary

The current model of digital advertising, which relies heavily on tracking and personalisation, is criticised for causing a range of problems for individuals and society as a whole. Among the solutions that are being debated is contextual advertising. In contextual advertising, ads are matched to the content being viewed rather than to users' personal data and behaviour throughout the web.

In this paper, we explore the key problems linked to tracking-based advertising and discuss whether a shift to contextual advertising could provide an alternative. We conclude that contextual advertising offers great potential. However, a standardised and narrow definition of contextual advertising is needed, along with regulatory measures, to exploit this potential. Otherwise, contextual advertising risks to replicate many issues, including surveillance, manipulation, and discrimination. We also highlight the need for a broader public and political debate on the deeper societal implications of digital advertising, including the role of the attention economy, and how consumers are understood in the digital age.

Authors:
Johanna Graf, Lukas Probst, Lena Steltzner, Leonie Wellmer

Edited by:
Christoph Bornemann

Graphics:
Rabea Düing – SALT.N.PAPER Studio für Gestaltung

Published by:
Germanwatch e. V.
Office Bonn:
Kaiserstr. 201
D-53113 Bonn
Phone +49 (0)228 / 60 492-0, Fax -19

Office Berlin:
Stresemannstr. 72
D-10963 Berlin
Phone +49 (0)30 / 57 71 328-0, Fax -11

Online: www.germanwatch.org
Email: info@germanwatch.org

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Contents

1 Introduction

Today's dominant digital advertising model based on tracking and personalisation has been criticised for creating a range of problems, both for individuals and for society as a whole. In response, various solutions are being debated. These include regulatory measures such as the introduction of a new horizontal legal framework that establishes clear limits on data processing, mandates proper transparency measures, and strengthens enforcement mechanisms (vzbv, 2025). Some proposals went as far as banning tracking-based personalised adverting altogether (Steltzner et al., 2025; Tracking-Free Ads Coalition, 2021).

The debate extends to broader sociopolitical questions: if advertising-funded digital spaces, such as news outlets or social media platforms, inherently carry risks for social cohesion and democracy due to their business model, do we need to consider alternative business models, such as subscription-based financing or even publicly funded alternatives that enable high-quality, independent information to animate and safeguard democratic discourse online?

Some civil society actors and political decision-makers argue that **shifting from tracking-based to context-based advertising might help to address some of the challenges for users and society at large** (European Parliament, 2021; Steltzner et al., 2025). In this paper, we discuss the core problems associated with tracking-based personalised advertising and assess whether a transition to contextual advertising can deliver on its promises and mitigate the problems involved.

The aim of this paper is not to offer final answers, but rather to encourage a broader public and political debate on the future of digital advertising.

2 How digital advertising works

Digital advertising has evolved over time, moving from a simple process involving advertisers and ad-publishing websites to a complex system that involves hundreds of actors. **Nowadays common automated online advertising is known as programmatic advertisement or Real Time Bidding (RTB).** RTBs are online real-time auctions in which various actors match user-centric profiles with the best-fitting content of ads, all within a fraction of a second. Machine Learning techniques support the matching process of the ad delivery by analysing large user data sets (Choi & Lim, 2020). Publishers use real-time auctions to determine the price of the ad space, with advertisers bidding against each other to determine the price (Zulaikha et al., 2020).

Relevant actors taking part in the digital advertising process can be clustered in subgroups according to their functions (see Table 1).

Table 1: Description of main actors and their functions in the current digital advertising market.

Actor		Function	Examples
User		Recipient of ads by visiting the publishers website, platform, or app	
Advertisers and Advertising networks (Companies and media agencies)		Promotion of products or services with targeted ads	Google Ads, Facebook Ads
Publishers (Websites, platforms, and apps)		Hosting advertisements and tracking user behaviour	Meta, Alphabet, Amazon, and smaller actors such as websites, e.g. media outlets (Spiegel Online, ZEIT ONLINE, WELT)
Intermediaries (Providers of advertising technology services)	**Supply-Side Platforms (SSPs)** (made for publishers)	Programmatic software for publishers to facilitate the sale of advertising impressions in an automated fashion (RTB)	Google Ad Managers, Setupad, Pubmatisch, ReklamStore, Sovrn
	Demand-Side Platforms (DSPs) (made for advertisers or marketers)	Matching ad inventories and advertiser via personal data-fed algorithms	Amazon Advertising, Google Display and Video 360, Criteo, Xandr Invest, the TradeDesk, Adform
Data Management Platforms (DMPs)		Capturing first and third party data and creating distinctive user profiles (audience segments) to optimise customer interaction	Microsoft (subsidiary formerly Xandr), Adobe Audience Manager, Amobee, Salesforce, Lotame, Oracle

In a simplified way, **the process of programmatic advertising** can be described in five steps (see also Figure 1):

1. When a **user visits a website**, opens an app, or scrolls though a feed containing advertisements, the publisher loads the content, and ad slots are prepared but not yet filled.
2. Simultaneously, once the user consents to cookies (often displayed in pop-up banners), **the publisher sends a bid request to the Supply-Side Platform (SSP)**. This request includes cookie data. The SSP's task is to act as an intermediary for the publisher and fill the slots of the ad inventory (the available advertising slots on publishers' websites). The bid request contains a granular spectrum of personal user data relevant for targeting advertisements such as:
    - Impression details: URL of the site (genre of information), site category, and topic.
    - User information: year of birth, gender, interests, metadata according to the consent, postal code.
    - Device information: type, OS, make, model, and version.
    - Cookie ID: user identification across websites for targeted advertising.
3. **The SSP then forwards a copy of the bid request to the Demand-Side Platforms (DSPs).** The RTB process is typically initiated during the page load, when the bid request reaches the SSP, which then passes it on to multiple DSPs for bidding. **The DSPs then place their bids in the Ad Exchange Market**. The DSPs act as intermediate for the advertisers and deal with mainly two tasks:
    - They review and evaluate the bid request.
    - If the request matches their target criteria, they decide how much to bid, depending on the degree of fulfilment, and accordingly place the bid to display their ad in the specified ad slot.
4. **The DSPs may use additional user profile data, such as user interest or behaviour, previously aggregated from Data Management Platforms (DMPs) to evaluate and enrich the bid request.** This data may have been uploaded to the DMPs by the advertisers or sourced by third-party data brokers.
5. **The DSP that submits the highest bid wins. The winning bid is passed to the publisher and the corresponding ad is displayed to the user.**

The entire bidding and ad selection process is realised within milliseconds. Algorithms of the advertising agencies determine which ad to display based on factors such as desired pricing and the user's associated data profiles (so-called audience segments) with hundreds of data points. Programmatic advertising with RTB allows for the automated processing of millions of bid requests per second.

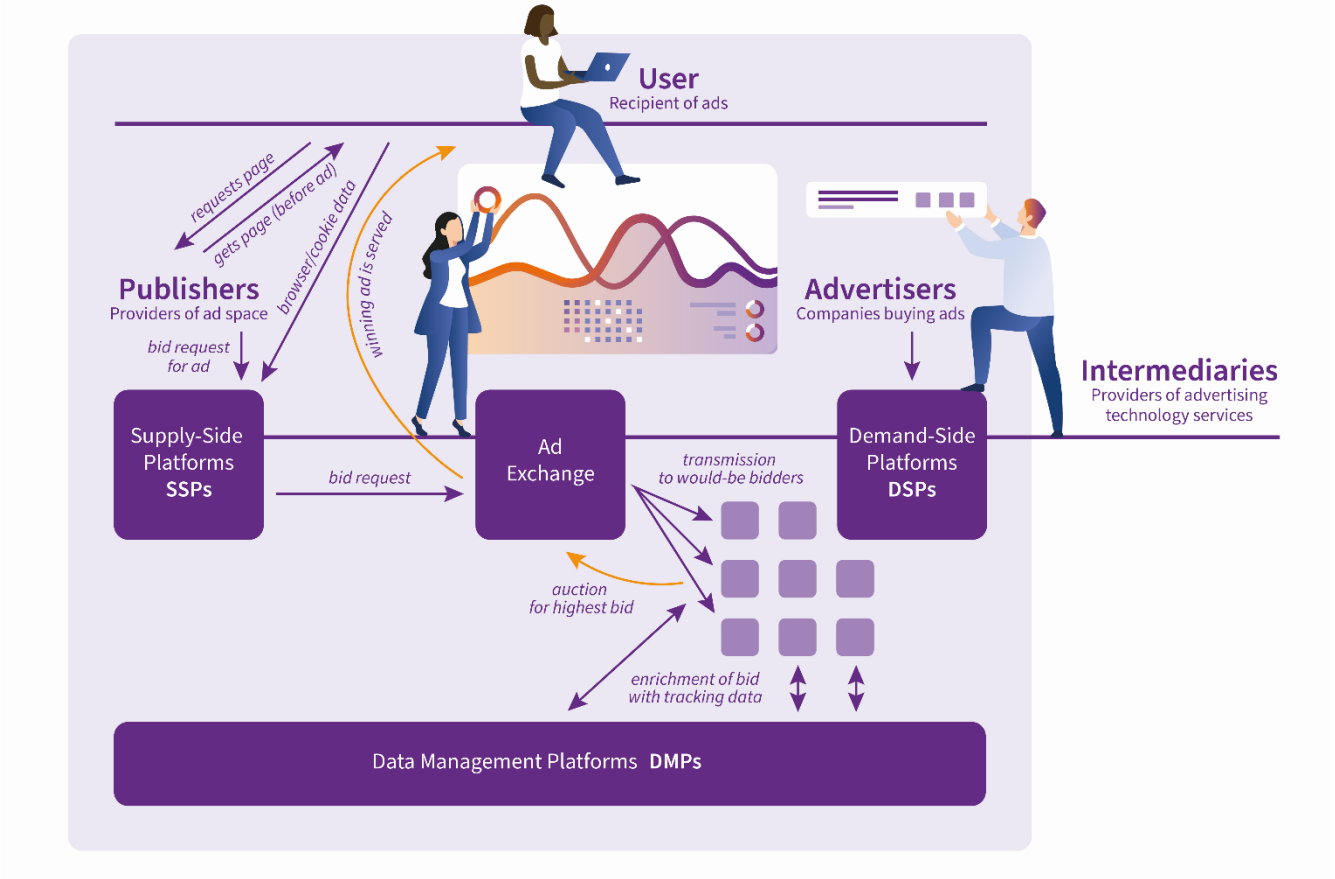

Figure 1: Main actors and processes in programmatic advertising; Rabea Düing, based on Veale & Borgesius (2022).

3 Core problems of tracking-based personalised advertising

Tracking-based personalised advertising[1] and the underlying processes undermine user protection at an individual level and entail social, economic, and ecological risks at a structural level.

3.1 Lack of transparency and risk of user data exploitation and surveillance

The online advertising ecosystem sprawls across a vast and complex network that includes advertisers, ad tech firms, and platforms that engage in advertising exchanges. Within these structures, personal data serve as the currency to secure economic advantages by systemic data trading. DSPs, most notably Google, The Trade Desk, and Criteo, manage an enormous amount of multi-seller auctions across the most frequented websites in the internet. **The massive data flows**

[1] In this paper also referred to as behavioural advertising.

involved, the complexity and opacity of the ad tech industry's structures make it difficult for users to understand how their data is collected, stored, and analysed.

The 2023 Consumer Conditions Scoreboard found that 70% of consumers are concerned about how their personal data is used and shared, a 21% increase compared to the European Commission's 2018 personalisation study (CCS, 2023; European Commission, 2018).[2] In a public consultation, 74% of consumers stated that their personal data had been misused or used unfairly to personalise commercial offers in the past year. In addition, 66% expressed concern over the processes of data collection and profiling, 57% over the installation of cookies. 38% reported a decline in trust in e-commerce, another 38% noted frustration with seeing only a limited selection of ads, and 37% highlighted the inability to opt-out. Furthermore, 35% said they struggled to distinguish between advertising and genuine information. These figures reflect a **deepening discomfort among consumers regarding the digital advertising ecosystem and their perceived lack of control within it** (CCS, 2023).

The survey conducted for the 'fitness check' of EU consumer law on digital fairness showed similarly that 41% of consumers encountered website or app interfaces whose design or language made it difficult to understand how their personal data would be used. Additionally, 38% had trouble understanding what kind of profile platforms had generated about them, and how it influenced the content or information shown to them (European Commission, 2024). **These structures not only undermine users' rights to informational self-determination but also reflect a substantial power imbalance between individuals and the dominant tech companies.**

Deceptive design patterns further complicate efforts to reject tracking. Empirical research by Zeng (2022) found that 44.6% of the ads surveyed were classified 'problematic', meaning they encouraged users to disclose personal data (Zeng, 2022). A study by Laux et al. (2021) identified problematic advertising practices on large platforms. These included 'misleading actions', in other words deceptive information that influences users' decisions, and 'misleading omissions', that is essential information being withheld, making informed consumer choices impossible. The EU 'fitness check' also found that 34% of consumers felt they lacked the option to opt out of personalised commercial offers, and 37% experienced difficulties changing their preferences about how their personal data is used due to design or language choices on the website/app (European Commission, 2024). The overwhelming number and design of cookie banners further contribute to user fatigue. Users are faced with consent forms that are excessively long, filled with technical jargon, and generally hard to read. This discourages informed decision-making and often results in users simply clicking 'OK' to proceed. So-called 'pay-or-okay' models, which offer tracking-free access only in exchange for a fee, add further pressure, exploiting users' limited resources and nudging them toward accepting tracking (Ullah et al., 2023). From a consumer protection standpoint, these models are problematic. (vzbv, 2024) Equal access to digital infrastructure is essential as it influences social and democratic participation, among other reasons.

It is not only consumers who are confronted with the lack of transparency in the online advertising market. A 2020 study for the British advertisers' association ISBA found that just 50% of advertisers' spending reached the publishers, while 15% of the funds were untraceable (ISBA, 2020).[3] These findings cast doubt on the supposed efficiency of the online advertising market, particularly regarding personalised ads (Grafenstein & Herbort, 2024). Another example illustrating that

[2] These findings are endorsed by BEUC's 2023 survey that found that 60% of consumers considered personal data analysis and monetisation to be unfair, and only 19% of consumers thought it is fair that they are targeted with personalised ads and content based on information about their lives and vulnerabilities (BEUC, 2023).

[3] A follow-up study from 2022 found that only 3% of advertising spending was untraceable (ISBA, 2023). However, the study has faced criticism, partly because the participants in the two studies were not the same, making direct comparison unreliable (Swimer, 2023).

intransparency can also entail advertisers' overspending is the case of Headphones.com. The company ran ads via Criteo and, after working with Check My Ads, discovered that their ads had appeared on conspiracy websites. They also learned that 95% of the publishers in the campaign were 'useless' – they were generating impressions without clicks. After eliminating these placements, Headphones.com was able to reduce its advertising spending from USD 1,200 per day to USD 40 (Check My Ads, 2020).

Beyond commercial concerns, **the collection of personal data and the information that is inferred by data analyses[4] carry significant risks of surveillance and misuse**. Investigative reporting by netzpolitik.org uncovered a data set with 3.6 billion data points from 11 million unique device IDs a data vendor platform had collected on a single day. The set was a free tester to promote a 14,000-dollar-per-month subscription offering real-time tracking of millions of smartphones. The data originated from everyday apps like weather, navigation, or dating apps. With the set, reporters were able to identify users' home and work locations (Dachwitz & Meineck, 2024). With limited options to opt-out of data systems, this example illustrates how serious intrusion into users' privacy can be.

3.2 Risk of user manipulation and digital discrimination

DMPs collect user data from diverse sources, analyse and repackage it, sell it to third parties, and thus enable cross-device tracking. This system is not only problematic due to its mass data collection but also due to how it processes and exploits that data. **Repeatedly, major players in tracking-based advertising are caught deliberately exploiting users' vulnerabilities as part of their business strategy**.[5] According to the EU 'fitness check', 37% of consumers had the impression that companies had knowledge about their vulnerabilities and used it for commercial purposes (European Commission, 2024). DMPs such as Xandr (owned by Microsoft) or Salesforce cluster the collected personal data sets in so-called audience segments (user personality profiles) and label them. Each segment comprises a collection of digital identification codes associated with specific attributes. They can contain user data that reveal sensitive information such as age, gender, ethnicity, sexual orientation, or religious beliefs.

An investigative report by netzpolitik.org (Dachwitz, 2023) revealed some of these troubling labels used by Xandr, such as 'moms who shop like crazy' or 'fragile seniors' (implying elderly individuals who are easy to deceive through teleshopping). Other segments included terms such as 'eating disorder', 'opiate addiction', or 'casino and gambling activities' – clear examples of how personal health and behavioural vulnerabilities are commercially exploited.

Targeting particularly vulnerable groups, such as children or addicts, can cause physical or psychological harm, especially when ads exploit suspected weaknesses to promote products like medications, addictive substances, or online games (Grafenstein & Herbort, 2024).

[4] Due to the profiling that underlies the targeting of advertising, not just the type of data collected but also the inferences drawn from it are key to upholding privacy. For example, food orders may hint at religious beliefs, while travel patterns, social networks, and activities can reveal personal interests or preferences. It is the inferred insights beyond the original data that often expose deeper aspects of individuals' private lives (Grafenstein & Herbort, 2024).

[5] One of the most known examples being the consulting company Cambridge Analytica that collected personal data belonging to millions of Facebook users without their consent for political advertising.

The manipulative nature of tracking-based advertising can also entrench existing social inequalities and discrimination (EDRi, 2021). As demonstrated by Kayser-Bril (2020), job advertisements on Facebook were served based on gender: trucking job ads reached 4,864 men but only 384 women, while childcare jobs were shown to 6,456 women and only 258 men. This kind of targeting, which is often executed without the user's knowledge or consent, demonstrates how surveillance-based advertising perpetuates digital and societal inequalities (Kayser-Bril, 2020).

The Feminist Tech Principles[6] (SUPERRR Lab, 2022) described another dimension of this issue: **racial profiling in digital spaces**. Marginalised groups, such as Black individuals or migrants, are often reduced to stereotypical personas during profiling processes. This fosters discrimination not only online but also in offline spaces. The Alliance for Universal Digital Rights (2024) warned that the lack of enforceable digital privacy rights disproportionately endangers marginalised communities and exacerbates digital inequality.

3.3 Undermining democracy and social cohesion

Social media platforms are an important player in the field of tracking-based advertising as they often generate revenue by selling both collected data and ad spaces. The more time a user spends on a platform or website displaying ads (publishers), the more ad impressions the publisher can sell. Publishers' monetising user attention is the mainstay of the **'attention economy': the more time people spend online, the more profit is made** (Center for Human Technology, 2021).

It is widely criticised that this business model inherently incentivises keeping users engaged for longer periods. In order to achieve that, **platforms often promote polarising content, which is more likely to capture users' attention**. This mechanism, however, **contributes to social division and undermines democratic cohesion**. A comprehensive meta-analysis confirmed that in democratic societies social media use correlates with increased social polarisation and declining institutional trust (Lorenz-Spreen et al., 2023). These concerns were echoed by whistleblower Frances Haugen, a former Facebook employee. In a testimony to the US Senate in 2021, she warned that Facebook prioritises profit over user safety and does not act in the public interest. According to Haugen, the platform's design fosters social fragmentation and harms democracy (US Senate Committee on Commerce, Science and Transportation, 2021).

Another consequence of the current ad tech industry structure is the **lack of transparency regarding where advertisements actually appear**. Ads are not only shown on reputable publisher websites or platforms but are also distributed across the open web, often without the advertiser's knowledge. Since intermediaries frequently withhold key information, advertisers have little or no oversight regarding the contexts in which their ads are displayed. **This opens the door for publishers that spread disinformation or polarising content thanks to tracking-based advertising revenues, without or against the intent of those sponsoring the ad** (Atkin, 2023). According to the website rating agency NewsGuard and media analytics company Comscore, approximately USD 2.6 billion is globally sent to publishers of misinformation and disinformation per year (Skibinski, 2021). The Check My Ads Institute remarked that the ads themselves or brand behind ads lend signals of legitimacy to visitors of disinformation or propagandist websites (Atkin, 2023). Displaying ads on problematic websites can also lead to serious reputational damages for the brand/advertiser. For example, in 2022, Check My Ads discovered that major car brands, such as Nissan and Audi, were advertising during livestreams of War Room, a show hosted by Steve Bannon,

[6] The 12 Feminist Tech Principles, developed by the SUPERRR Lab, together with multiple actors advocating for digital rights and marginalised groups, promote guidelines for tech policy and technological creation.

known for spreading extreme and inflammatory content, including calls for violence (Atkin, 2023). A study from 2024 revealed that advertising companies can face consumer backlash for financing misinformation outlets through advertising. Especially women and/or left-leaning consumers are likely to switch consumption away from companies whose advertising appears on misinformation outlets. The study further showed that the use of digital advertising platforms amplifies the financing of misinformation, and decision-makers in advertising companies are ill aware of the role their companies play in financing misinformation outlets (Ahmad et al., 2024).

On top of that, **the data collected for tracking-based advertising can be exploited by propagandists and disinformation actors to target users who are especially receptive to manipulative content.** As in the case of Cambridge Analytica, when Facebook data was exploited for political campaigning, the propagation of political messages through targeted advertisements has a significant power to manipulate the public discourse (Kurz & Dachwitz, 2019). Further, the potential misuse of audience segments such as 'judges', 'politicians', or 'German civil servants' raises concerns over illegitimate manipulation of people in leadership or sensitive positions (Ryan & Christl, 2023).

The root of the problem lies in the **inherent conflict between economic incentives for publishers and intermediaries to maximise ad revenue and the societal need for stricter regulation, transparency, and democratic accountability in advertising**. Without regulatory intervention, tracking-based advertising continues to pose a growing threat to democratic processes and social cohesion.

3.4 Increased dependence on big tech limiting digital sovereignty

Many major tech companies derive a substantial portion of their revenue from targeted advertising. This involves tracking, collecting, and monetising user data, selling ad space, or offering services within the digital advertising ecosystem, such as Google Ads. In particular, **Alphabet (Google), Meta, and Amazon dominate this space**, with Google alone accounting for 39% of global digital advertising spending in 2023 (Statista, 2023).

Critically, these big tech companies are monopolistic gatekeepers, especially when it comes to data access and control. Their privileged access to vast amounts of user data gives them unparalleled leverage over advertisers and consumers alike. Their dominance allows them to set the rules for the digital advertising market, shaping how advertisements are displayed, targeted, and delivered. **This not only raises serious concerns about user privacy but also impacts fair competition** (Tracking-free Ads Coalition, 2021).

While the combined revenues of major European publishers have remained stagnant over the past decade, Alphabet and Meta have seen significant global growth over the same period. A study commissioned by the European Commission concluded that this results in a 'frenemy' dynamic (Armitage et al., 2023). Those on the periphery of the ecosystem, particularly publishers and advertisers, have become heavily reliant on big tech, especially on the two dominant platforms, with no viable alternatives. Grafenstein & Herbort (2024) interviewed representatives of small and medium-sized advertisers and publishers. Participants described the situation as 'take it or leave it', with publishers reporting revenue losses if they did not comply with the system (Grafenstein & Herbort, 2024).

The entrenchment of big tech monopolies also suppresses innovation and hinders the development of alternative digital advertising solutions and platforms that might prioritise ethical standards, collective benefit, or public interest over profit. Independent or smaller-scale

platforms face major structural disadvantages in accessing data, reaching audiences, or securing fair advertising revenue, further reinforcing the market imbalance (Fourberg et al., 2021).

Moreover, these big tech companies have substantial influence over industry standards and regulations. As the EU digital infrastructure depends on them and as they invest large sums in lobbying clout,[7] they are in a position to shape regulations in ways that prioritise their profits over user protection, thereby reinforcing their market monopoly. This long-standing dominance poses a challenge to shape digital platforms equitably and limits democratic interventions such as the introduction and enforcement of platform regulations (Bank et al., 2021).

3.5 Climate damaging data flows

The data processing required for digital advertising is energy and resource-intensive and thereby produces emissions that drive climate change. Activities such as tracking, profiling, predictive modelling, and data exchange generate massive and continuous data flows, demanding substantial computing power**.** A study by Pärssinen et al. (2018) estimated that, in 2016, digital advertising produced around 60 million tons of CO_2e emissions, based on the German electricity mix emission factor at that time (Pärssinen et al., 2018). Since the number of online users has soared since 2016, and advancements and complexity in advertising technologies continue to accelerate the energy use, carbon emissions from online advertising are expected to have risen significantly today (Riduan, 2024).

Concrete data on the environmental footprint of digital applications remains scarce. According to the 2023 IAB Sustainable Advertising Report, over half of companies do not measure emissions from digital ad delivery (Industrial Advertising Bureau Europe, 2024). This reflects a broader global issue: most countries do not collect GHG emissions data related to the ICT sector (World Bank, 2024). This lack of transparency creates major knowledge gaps in our understanding of the environmental impact of digital advertising.

Despite limited data, evidence suggest that reducing data waste needs to be taken into consideration. Adalytics Research LLC (2023) indicated after conducting a self-experiment that less than 25% of displayed advertisements in the current online advertising system are perceived relevant by users, as they do not increase user engagement (Adalytics Research LLC, 2023). Semi-structured interviews with ad-tech experts and publishers conducted by Blomberg (2023) revealed a consensus on the need for systemic frameworks to standardise sustainable digital marketing practices. One key recommendation is a shift from hyper-personalised, tracking-based ads toward contextual advertising, which can potentially reduce energy usage while improving relevance (Blomberg, 2023).

Online advertising does not only contribute directly to emissions but also indirectly affects climate action through amplifying misinformation. As Heffernan (2023) noted, the polarisation of misinformation campaigns, amplified by social media algorithms, is the most serious threat to fighting climate change in the digital age (Heffernan, 2023). In the status quo of legislation, both advertisers and publishers/platforms will continue to spread climate disinformation as long as it remains profitable and legal (Pogson, 2021). Thus, advertising models that rely on fact-checking and educational approaches rather than misinformation/doubting climate science and profiting from carbon-intensive lifestyles may be a cornerstone to address underlying issues (Cook, 2019).

[7] The NGO LobbyControl found that the digital industry had spent more than EUR 113 million on lobbying in Brussels in 2022. This represents a jump from EUR 97 million in 2021 (Leyendecker, 2023).

4 Contextual advertising as an alternative?

Contextual advertising offers targeted advertising options determined by the content being viewed. The context of user preferences is tailored as a proxy for various types of data such as interest, intent, and demographic information.

Typically, this form of advertising is achieved through two methods, which are often combined: (1) analysing the webpage's content, such as identifying specific keywords, and (2) evaluating the page's URL (Armitage et al., 2023). These systems often use Natural Language Modelling (NLM) techniques to predict the likelihood of a user engaging with an ad, for instance, to make a purchase. Similar to targeting-based behavioural advertisement, the ads are often delivered programmatically by RTB processes (Armitage et al., 2023).

The ad deployment relies on the user's context, not on user tracking. For example, when someone reads an article about cars, they may see ads for car-related services on the same page. By contrast, tracking-based advertising might continue to show the same ads even after the user navigates away, relying on persistent data profiles, a practice known as retargeting (Bleier, 2021).

Examples of contextual advertising

- **Kobler**, **OptOut Advertising**, and **Qwarry**, based in Norway, the Netherlands, and France respectively, offer contextual advertising based on keywords and textual analysis (Armitage et al., 2023).
- **Dstillery** and **Jellyfish**, based in the US and UK respectively, provide advertising solutions utilising so-called URL embeddings (Armitage et al., 2023).
- Following a switch to contextual advertising, the **Dutch public broadcaster Nederlandse Publieke Omroep (NPO)** saw its ad revenues increase by 9–27% each month (Armitage et al., 2023; Ryan, 2020).
- After the European General Data Protection Regulation (GDPR) was introduced, **The New York Times** International blocked all open-ad buying in Europe and moved to direct selling and partly contextual advertising solutions, reporting that ad revenue did not decline but in fact increased (Davis, 2019; Southern, 2020).

4.1 Data exploitation and privacy

Privacy advocates often endorse contextual advertising as a safer alternative to personalised/behavioural advertising. **Unlike personalised advertising, contextual advertising in a narrow understanding does not rely on invasive data collection, profiling, or cross-site tracking.** Supporters argue that it upholds contextual integrity, the idea that contextual circumstances determine the privacy of informational flows. For instance, a doctor sharing private information about a patient's diagnosis with nurses and health insurance to proceed in medical healthcare treatments is appropriate, whereas sharing it with the employer would be a violation (Bleier, 2021).

Interviews with contextual advertising providers suggest that it is possible to deliver contextual ads without using any personal data or persistent identifiers. They assert that without persistent identifiers, advertisers or intermediaries delivering contextual ads cannot identify the user to whom the ad was displayed (Blomberg, 2023). Without such identifiers, advertisers cannot build long-term user profiles, ads are delivered solely based on momentary content. **Moreover, contextual advertising can reduce the number of intermediaries involved, for example through the absence of profiling** (Armitage et al., 2023). This approach could significantly reduce the amount of personal data shared with third parties compared to current advertising practices.

Despite these benefits, contextual advertising is not without its challenges. **A lack of clear standards and definitions has led to concerns about 'privacy washing'**, when companies claim to use contextual methods but still process behavioural or personal data, or use identifiers. Hybrids that merge contextual information as just one signal among many to target ads are not uncommon. Other signals can include personal data gathered by third parties and information from advertising profiles linked to ad identifiers.

In some cases, contextual information can be used to infer personal data and profile individuals by linking them to persistent identifiers that collate multiple sources of data. For example, Google's current 'contextual targeting' solutions include language, location, and recent browsing behaviour.[8] A report to the European Commission warned that **connecting contextual information to a persistent advertising identifier may mirror practices of behavioural advertising**, with contextual data being transformed into inferred interests, intent, or sensitive data categories, some of which fall under Article 9 of the GDPR. If used in RTB, this data could be widely shared with third parties (Armitage et al., 2023).

Many contextual ad tech firms claim to operate without user data, yet often rely on session-based information like browser and page-level data, device, and app-level data. Although these techniques are framed as temporary and therefore non-tracking, they blur the line between contextual and behavioural targeting (Kopp, 2023).

Moreover, there are reports of contextual advertising providers using personal data for training the underlying models: both Dstillery and Jellyfish acknowledged in their white papers that the models they utilise were trained on personal data, including information gathered through RTB. Presently, Dstillery's solution employs a panel of 100,000 users per market for training its model. However, the company emphasises that this data is strictly utilised for training purposes and not for targeting ads at the individuals comprising the panel.

4.2 Manipulation and discrimination

Contextual information can be used to infer interest, intent, and demographic data. In some instances, this may involve sensitive characteristics protected under Article 9 of the GDPR, such as political beliefs, religious affiliation, racial or ethnic origin, health status, or sexual orientation. For instance, religious affiliation could be inferred from articles about certain foods. This means advertisers could indirectly target individuals based on inferred special category data, even without explicitly processing such data. This could result in the reinforcement of harmful stereotypes or discriminatory practices. The Digital Services Act (DSA) has prohibited advertising based on profiling using special category data (Article 26.3), but concerns remain among civil society organisations that the provision lacks clarity, particularly when it comes to inferences drawn from non-sensitive

[8] See Google Ads, Glossary, Contextual Advertising (accessed 28 July 2025).

data that may function as proxies for protected attributes, like sexuality, religion, or health (Armitage et al., 2023).

Targeting based on content preferences of fine-tuned demographic characteristics (household income less than USD 20,000, for example)[9] **can perpetuate discriminatory practices**, may result in disparate impacts, and deepen existing social inequalities (Kopp, 2023).

Furthermore, also **context information can be exploited manipulatively**. For example, placing weight-loss ads alongside content about eating disorders, or displaying alcohol ads on sobriety-focused websites, may cause harm to vulnerable individuals (vzbv, 2025; Maréchal & Doty, 2024).

A growing concern is the rise of 'neuroprogrammatic advertising', where AI and NLP is used to infer users' emotional states based on the content they consume. Ads can then be tailored to these moods to increase engagement. For example, basketball fans might be targeted at the exact time they are most emotionally receptive to buying new trainers (Cantu, 2023). While such techniques may enhance marketing effectiveness, they also risk crossing ethical boundaries by manipulating users' subconscious decision-making in sensitive situations and exploiting emotional vulnerabilities (vzbv, 2025).

4.3 User perception, performance, and profitability

Consumer sentiment seems to favour contextual advertising. A British study found that four out of five UK consumers preferred ads that were relevant to the content they were viewing (Integral Ad Science, 2020). Similarly, a study conducted by the University of Southern California and brand safety vendor Channel Factory showed that contextually aligned ads on YouTube were 93% more memorable than misaligned ones (Channel Factory & Barazza, 2020). However, these studies do not clarify whether the advertising placement relied solely on context or still used personal identifiers.

Proponents claim, **contextual advertising is not just about privacy, it can be just as, if not more, profitable for advertisers**. Companies utilising contextual advertising such as RevAmp, Dstillery, and IPG Media Lab reported more accuracy and performance (Armitage et al., 2023). An analysis of video ads on YouTube by IPG Media Lab and Zefr (a provider of technology solutions enabling context-based ad targeting) found that users exposed to contextually relevant ads exhibited a 63% higher purchase intent compared to those exposed to tracking-based ads. Additionally, these users were 83% more inclined to recommend the advertised product and displayed a 40% higher level of brand favourability (Armitage et al., 2023).

However, measuring the success of contextual advertising remains a challenge: contextual advertising providers (Kobler, Opt Out Advertising, Qwarry, and Dstillery) report that while it is possible to count impressions, clicks, and viewability in real time, it is not possible to measure reach, frequency, and conversions without the use of identifiers (Armitage, 2023).[10] The former can be reported by the browser back to the intermediary. In the case of conversations, for example, there is no way for an advertiser to attribute a user's view or click on an ad with their purchase of a product

[9] See Oracle's content affinity segments (accessed 28 July 2025).

[10] Advertising success is commonly measured using criteria such as click rates (user engagement with an ad), impressions (how often an ad is displayed), viewability (whether the ad is actually seen), reach (the total number of individual viewers or listeners), frequency (how often a person sees the ad), and conversions (how effectively the ad prompts a specification, such as making a purchase).

without an identifier, as opposed to tracking-based personalised advertisement (Armitage et al., 2023).

Conclusions on profitability are limited due to little independent data and studies regarding the performance of contextual advertising compared with current digital advertising models. The studies that do exist primarily take the form of small-scale surveys and case studies and are often developed by vendors of contextual advertising solutions and other intermediaries (Armitage et al., 2023).

In terms of advertisers' expenses, less intermediary involvement may reduce costs. A study by advertising agency GumGum focusing on four contextual solutions found that the cost-per-click (CPC) and cost-per-mile (CPM) were 48% and 41% lower, respectively, than in profiling-based ads (GumGum 2020). However, these findings lack independent verification. Moreover, a shift towards widespread contextual advertising could alter the market and influence cost dynamics.

Some case examples suggest promising results for publishers: by switching to context-based advertising models, The New York Times and the Dutch public broadcaster NPO have reportedly maintained or even increased ad revenue (Ryan, 2020; Southern, 2020). However, The New York Times model is not contextual in a narrow sense as the newspaper collects its own user data (first-party-tracking) to enrich advertising (Prabhat, 2020). Again, **independent research is needed to draw conclusions on a broader scale.**

4.4 Dissemination of disinformation

There is no definitive answer as to what consequences a shift towards contextual advertising might have on the dissemination of disinformation. On the one hand, **publishers such as social media platforms may continue to advantage polarising or emotionally charged content, or even disinformation, due to the attention economy** (still making profits from placing ads and user engagement). On the other hand, Armitage et al. (2023) argued that the probability of an advertisement being placed next to harmful content decreases substantially when contextual advertising is employed. This is largely because contextual advertising allows for the targeting of specific content environments. Similar to brand safety approaches, this **grants advertisers greater control over the types of pages and narratives with which their ads are associated**.

Nonetheless, the effectiveness of this approach also depends on the nature of the product or service being advertised. For instance, in the case of hiking boots, contextual targeting may ensure that adverts appear only on credible and thematically relevant websites (outdoor enthusiast blogs or travel gear reviews) thus avoiding association with harmful or misleading content. In such instances, contextual advertising can serve as a practical tool to uphold brand safety. However, the situation is more complex for products with a sociopolitical or ideological dimension. Take, for example, a mobile application designed to promote environmentally friendly behaviours. Despite being contextually targeted, adverts for such an app could inadvertently appear on websites or next to content disseminating climate misinformation, particularly if these sites contain superficially relevant keywords or phrases.

Contextual advertising providers are increasingly turning to advanced technologies such as NLP. According to Seedtag (2022), NLP facilitates 'deep sentiment and tone analysis, going way beyond just placing keyword blocks on articles'. Deeper linguistic understanding or sentiment analysis might allow for an evaluation of the overall tone of an article (whether it is supportive, critical, or neutral) before placing an advert. Seedtag stated that this can partially remedy the issue of unintentional financing and legitimisation of disinformation and harmful content. However, as described above NLP and AI-driven content analysis hold other risks.

4.5 Lack of industry standards and definitions

The lack of a universally accepted definition of contextual advertising hinders both a shared understanding within the industry and the development of effective regulatory frameworks (Grafenstein & Herbort, 2024; Kopp, 2023). This gap allows for contextual data to be used as a proxy for personal, and sometimes sensitive, information. This means individuals may still be profiled and monitored not based on their behaviour, but on the content they consume. As Kopp (2023) warned, without policy intervention, this could give rise to an even more pervasive system of surveillance than the current behavioural advertising model. Contextual advertising, in its present form, cannot be regarded as a true alternative to surveillance-based behavioural targeting, nor as a remedy for its associated harms. Kopp stressed the urgent **need for a clear, contemporary definition of contextual advertising, one that recognises and seeks to mitigate these risks**. Relying on industry self-regulation is insufficient, and existing legislative proposals fail to capture the complexity and potential dangers of modern contextual advertising. According to Kopp, **without meaningful oversight, there is a real risk that a new form of surveillance that masquerades as user-friendly marketing will continue to evolve unchecked**.

Understanding what data, processes, and actors are involved in contextual advertising, and having a shared comprehension and definition is important from a policy standpoint. Discussions surrounding digital advertising in the context of the DSA, for instance, have at times operated under the assumption that contextual advertising never entails the use of personal data.[11]

5 Summary and conclusion

Tracking-based personalised advertisement bears many individual and structural risks:

- **Lack of transparency and the risk of user data exploitation and surveillance:** The online advertising ecosystem is highly complex and opaque, relying heavily on personal data trading, often without users' clear understanding or consent. Many consumers feel overwhelmed by manipulative consent mechanisms, unclear profiling practices, and deceptive ad designs, leading to frustration, reduced trust, and limited control over their digital privacy. This lack of transparency affects not only users but also advertisers, who face inefficiencies and hidden costs, while the scale of data collection poses serious risks of surveillance and misuse.
- **The risk of user manipulation and discrimination:** DMPs collect and repackage user data into detailed profiles, often including sensitive information such as health status, ethnicity, or vulnerabilities, which are then sold for targeted advertising. Investigations have revealed harmful labels like 'fragile seniors' or 'opiate addiction', raising serious concerns from a consumer protection standpoint. This practice also risks to reinforce social inequalities and discrimination, particularly affecting marginalised communities.
- **Undermining democracy and social cohesion:** Tracking-based personalised advertising is a core business model for major platform companies. To maximise ad revenue, these platforms often amplify polarising content that captures users' attention and keeps them engaged. This approach deepens social divides and weakens democratic cohesion. At the same time, the opaque structure of the ad tech industry and the programmatic distribution of adds all over the web allows advertising money to (unintentionally) fund disinformation outlets, and further enables the targeted manipulation of (politically) receptive individuals and even people in positions of power.

[11] In its opinion on the DSA, the European Parliament's Committee on Civil Liberties, Justice and Home Affairs advocated for the phasing out of 'behavioural and personalised targeting', to be replaced by contextual advertising, based on the assumption that 'displaying contextual advertisements does not require processing personal data and is thus less intrusive' (European Parliament, 2021).

- **Increased dependence on big tech limiting digital sovereignty**: The dominance of big tech companies like Alphabet, Meta, and Amazon in the digital advertising market gives them disproportionate control over user data, industry standards, and market access, raising serious concerns about privacy, fair competition, and democratic oversight. This monopolistic power limits digital sovereignty, as smaller publishers and advertisers have become increasingly dependent on these platforms, leaving little room for alternative, more public interest oriented digital solutions.
- **Climate damaging data flows:** Digital advertising generates large amounts of carbon emissions due to energy-intensive processes such as tracking, profiling, and data exchange. Despite limited research, experts highlight the urgent need for sustainable practices, including the reduction of data exchange, and warn that the current model not only wastes energy and resources but also amplifies climate misinformation, undermining efforts to tackle the climate crisis.

Contextual advertising offers notable potentials: greater privacy, fewer intermediaries, and more transparency for users on why certain adds are being displayed. **However, in order to exploit this potential, a standardised and precise definition that returns to the original, narrow understanding of contextual advertising is needed, along with regulatory measures. Otherwise, there is a risk that contextual advertising will replicate many of the problems it claims to resolve**, including surveillance, manipulation, and discrimination.

Clear definitions will be essential to ensure that contextual advertising delivers on its promises, especially regarding offering a privacy-preserving alternative, alongside transparent practices and regulatory oversight. New technological developments involving AI and NLP underscore this.

More independent data and research is needed to assess how contextual advertising models perform in comparison to the current system, and how a switch to contextual advertising could impact advertisers and publishers, to encourage broader adoption among them.

What contextual advertising could (not) solve

✓ **Less privacy and surveillance concerns:** When implemented strictly without relying on behavioural or personal data, or personal identifiers, contextual advertising can reduce the risk of data exploitation and surveillance.

More transparency: Ads are shown based on the content of a webpage rather than user profiling. Why ads appear is thus easier to understand, and the mechanism only operates when users actively look at webpages. This improves perceived transparency, although the underlying ad infrastructure may still be technically opaque and complex for most users.

✗ **Attention economy:** Even when switching to contextual advertising, publishers still remain incentivised to maximise time spent on their sites and keep users engaged as long as possible, often by promoting polarising or emotionally charged content. This continues to fuel societal issues such as disinformation and political polarisation.

Manipulation and digital discrimination: Risks of user manipulation or discriminatory targeting are reduced but remain. While the lack of cross-site tracking reduces long-term profiling and targeting and selling these data to other actors with economic or political interest, there is still potential for real-time contextual manipulation and discrimination. The risk increases with new technological developments and blurry definitions of contextual advertising (for example, AI-driven contextual systems inferring emotional states from page content and tailoring ads accordingly).

What remains unclear

? **Impact on digital sovereignty and big tech dominance:** It is uncertain how a widespread shift to contextual advertising would alter the power dynamics in the digital advertising ecosystem. While major players like Alphabet and Meta may lose revenue, they would still control the core infrastructures (advertising services, browser technologies, platforms) that enable rapid adaptation. It is likely they will find alternatives to monetise data within a contextual framework.

Potential reduction in climate harmful data flows: Contextual advertising generally involves less sharing of data with third parties compared to behavioural advertising and fewer intermediaries. As a result, the environmental impact associated with large-scale data processing and storage might also decrease, though this remains to be proven empirically.

Moreover, there is a pressing need to **broaden public and political discussions around the underlying dynamics of digital advertising, including the attention economy**. If advertising-financed actors such as digital media outlets and social media platforms are inherently linked to monetising users' attention (often through the spread of polarising or emotionally charged content), alternative financing approaches and business models need to be discussed. These should safeguard access to reliable, fact-based information and support democratic discourse in the digital space.

Furthermore, **a new understanding of users/consumers in the digital space needs to be developed**. Given the persistent power imbalances and lack of accessible information, individuals cannot realistically act in a fully self-determined manner. Existing consent mechanisms, such as those set out in the GDPR, are insufficient to meet the challenges users face online. Regulatory approaches such as the Digital Fairness Check may offer a useful starting point for addressing these shortcomings.

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Germanwatch – Bonn Office
Kaiserstr. 201
D-53113 Bonn, Germany
Phone: +49 (0)228 / 60492-0
Fax: +49 (0)228 / 60492-19

Germanwatch – Berlin Office
Stresemannstr. 72
D-10963 Berlin, Germany
Phone: +49 (0)30 / 5771328-0
Fax: +49 (0)30 / 5771328-11

E-mail: info@germanwatch.org

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