Immersive Realities – Benefits and Challenges to Freedom of Expression

Feasibility Study

COUNCIL OF EUROPE
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Feasibility Study on Benefits and Challenges to Freedom of Expression in Immersive Realities

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1. Introduction

This study, elaborated under the terms of reference of the Steering Committee for Media and Information Society (CDMSI), builds on the findings of the recently completed Council of Europe (COE) and Institute of Electrical and Electronics Engineers (IEEE) joint report, *The Metaverse and its Impact on Human Rights, the Rule of Law, and Democracy* (Council of Europe and IEEE 2024). That comprehensive report examined the broader implications of the metaverse and related extended reality (XR) technologies on fundamental human rights, with a focus on privacy, identity, and freedom of expression. It outlined the ethical and legal considerations that may arise as these technologies mature and become widely adopted, emphasizing the unique challenges posed by the immersive and pervasive nature of XR environments.

XR technologies enable real-time, high-stakes interactions that have implications for users' rights in ways not previously seen in traditional digital spaces. Recognizing these complexities, the COE/IEEE report underscored the need for a more focused examination of how XR impacts freedom of expression. Our project builds on this foundation by conducting a feasibility study specifically addressing this fundamental human right, with particular attention to content and behavioural moderation in XR environments. The study also integrates feedback from stakeholders and experts received in stakeholder consultations and in a Steering Committee on Media and Information Society (CDMSI) workshop.

By analyzing how XR technologies empower and restrict expression, this study aims to evaluate whether existing legal instruments, including those under the Council of Europe and the European Convention on Human Rights (ECHR), adequately protect freedom of expression in immersive realities. The outcomes of this analysis will inform the development of best practices, guidelines, and potential regulatory updates for policymakers, platform developers, and XR technology providers. Any forthcoming guidelines will need to propose a balanced approach that safeguards the rights of users to express themselves freely while ensuring that XR environments remain safe, inclusive, and respectful of other fundamental rights.

In line with recent CDMSI expert exchanges, the study recommends that any forthcoming work should proceed through a staged process, beginning with soft-law clarification before potentially advancing toward further guidance.

This study situates its analysis within the broader context of international human rights law, exploring the intersection of XR technologies and freedom of expression. XR, encompassing virtual reality (VR), augmented reality (AR), and mixed reality (MR), is characteriszed by its immersive, interactive, and embodied nature. Often referred to as spatial computing, XR creates three-dimensional digital spaces that integrate sensory input, emotional engagement, and spatial representation to an unprecedented degree. These unique features offer transformative opportunities for communication and creativity while presenting significant regulatory challenges (Council of Europe and IEEE 2024).

Freedom of expression, enshrined in Article 10 of the ECHR, includes the rights to seek, receive, and impart information and ideas without interference (Council of Europe 1950). XR amplifies both the potential for exercising these rights and the risks to their realization. On one hand, XR provides novel avenues for artistic expression, political discourse, and participatory democracy, enabling individuals to transcend physical and linguistic barriers through immersive engagement. On the other hand, XR's immersive and embodied features heighten vulnerabilities to disinformation, psychological persuasion, and augmented surveillance capabilities. These same features also intensify the emotional and psychological impacts of online harms, such as harassment and censorship.

This study addresses:

- The technical capabilities and societal implications of XR technologies.
- The opportunities and risks that XR poses to the exercise of freedom of expression.
- The applicability of existing human rights frameworks and identification of possible legal gaps.
- Recommendations for policymakers, technologists, and civil society to balance innovation with human rights protections.

As with the advent of the internet and social media, XR technologies demand a nuanced approach to governance that ensures they enhance rather than undermine fundamental rights. By closely examining freedom of expression within XR, this study aims, in addition to examining whether and to what extent existing freedom of expression standards may function in extended reality, to assess the need and contribute to the development of human rights-centered governance models for the next generation of immersive technologies, with a view to ensuring that freedom of expression is safeguarded as XR becomes an integral part of digital ecosystems.

2. Understanding XR Technologies

XR technology introduces immersive digital environments that enable unprecedented levels of interaction and engagement. Its three defining features, namely presence, immersion, and embodiment, distinguish XR from other digital media (Bailenson 2018) and make it a transformative, albeit challenging, frontier for legal and regulatory frameworks (Sánchez-Vives and Slater 2005; Council of Europe and IEEE 2024). This section explores the technical underpinnings of XR and emerging trends, highlighting their implications for freedom of expression.

2.1 Key Technical Features of XR

Extended reality technologies operate through a combination of hardware, software, and user-centric design elements that together create immersive digital experiences. These systems rely on real-time data processing, advanced rendering techniques, and sensory feedback mechanisms to blur the boundaries between physical and virtual environments. (Heller 2020a). This section explores the foundational components of XR systems, emphasizing their role in creating environments that support freedom of expression.

Hardware Infrastructure

At the core of XR systems are **specialized hardware devices designed to enhance immersion and user engagement**. Head-mounted displays (HMDs) or AR interfaces, motion-tracking sensors, and haptic feedback devices are pivotal in bridging the physical and digital worlds (McGill et al. 2021; Miller et al. 2020). HMDs, such as VR headsets, employ high-resolution stereoscopic displays and wide fields of view to generate realistic virtual environments (Bailenson 2018). These devices are often coupled with motion-tracking sensors, including inward facing cameras for eye tracking and capturing expressions. Alongside these sensors are external cameras and inertial measurement units (IMUs), which detect user movements and translate them into virtual space (Heller 2020b). This combined functionality allows users to interact with their surroundings naturally, fostering a sense of presence (Slater 2009; Kilteni et al. 2012).

Augmented reality interfaces, such as smartphones and smart glasses, play a critical role in bridging the physical and digital worlds. Unlike **fully immersive virtual reality** systems, these devices overlay digital content onto the real environment, allowing users to interact with

augmented elements while remaining aware of their surroundings (World Economic Forum 2023). Smartphones and tablets, with their integrated cameras and motion sensors, serve as accessible entry points for AR, enabling users to experience applications ranging from gaming to navigation without additional hardware (Berrick and Spivack 2022). Smartglasses, such as Ray-Ban Meta Glasses and Snapchat Spectacles, elevate this experience by providing hands-free interaction and more sophisticated capabilities, such as embedded AI assistants, spatial mapping, and real-time object recognition (EssilorLuxottica and Meta 2023; Snap Inc. 2024). These devices rely on embedded sensors and transparent displays to project contextual digital overlays seamlessly into the user's field of vision (Heath 2024).

Mixed reality combines features of VR and AR, allowing users to interact with digital objects while remaining aware of their physical surroundings (World Economic Forum 2023). For example, a user in MR might interact a virtual object, like training a virtual puppy to sit, that is anchored to a physical space, like a real living room rug. MR technologies are particularly useful in sectors like healthcare and design, where professionals need to visualize complex data while maintaining a connection to the physical environment. The Apple Vision Pro is an example of MR, allowing users to toggle even the degree of digital overlays on their physical space (Apple Inc. 2023). While the Vision Pro provides an "'up-market" version of MR (spatial computing to use Apple's preferred term), more affordable devices such as the Meta Quest 3 and Pico devices also afford excellent MR (Meta Platforms Inc. 2024; Pico Technology Co. Ltd. 2024).

Web XR technologies further expand VR and AR's accessibility by leveraging standard web browsers to deliver immersive content without requiring specialized applications (Heller 2020a). This framework allows developers to create cross-platform immersive experiences that function on a variety of devices, democratizing access to augmented environments. However, the reliance on cloud-based data processing for **Web XR** introduces unique challenges, including latency issues and potentially heightened risks to user privacy (Pangilinan et al. 2021). As these interfaces become more prevalent, ensuring equitable access and robust data protections will be critical to their widespread adoption and alignment with freedom of expression principles (Heller 2020a).

Haptic devices add another layer of realism by providing tactile feedback, enabling users to "feel" interactions within XR environments (Matamala-Gómez et al. 2019). For example, gloves embedded with actuators simulate the pressure, temperature, and texture-based sensations of touching objects, which is particularly useful for applications in education, healthcare, and design. Other newer XR enhancements have even included smell simulators to further increase the realism of immersive content (Heller 2020b).

Future hardware will depend on further innovation, in particular increasing battery power, decreasing the weight of HMDs, and developing affordable synthetic materials to make screens that are bright enough for daytime use (World Economic Forum 2023).

Software and Rendering Technologies

The effectiveness of XR systems depends heavily on sophisticated software capable of real-time rendering and interaction. Like flat-screen computing, this relies on coding. An XR engine is a software-development environment designed for people to build XR experiences such as games and other XR applications. The core functionality typically provided by XR engines include a rendering engine for 2-D and 3-D graphics, a physics engine or collision detection and response, an audio engine, and artificial intelligence (Heller 2020b). Rendering engines, such as Unreal Engine and Unity, are critical for generating photorealistic environments and simulating dynamic elements like lighting and physics (Epic Games 2025; Unity Technologies 2024). These optimize

graphical fidelity while minimizing latency, ensuring seamless user experiences even in complex virtual scenarios.

XR systems have more recently started to incorporate artificial intelligence to enhance interactivity and personalization. For instance, natural language processing enables users to communicate with virtual characters or systems, while machine learning algorithms tailor environments to individual preferences (Tseng et al. 2022). This personalization enhances user engagement. Generative AI, combined with XR, may be used to create dynamic environments and content for virtual worlds, in ways that open up creative processes to those who do not have specialized knowledge of coding (Epic Games 2025; Unity Technologies 2024). In any case, it is now straightforward to connect a large language model (LLM) agent to a VR/AR/MR application, so that for example, a virtual human character can monitor and take part in discussions with human participants (Rosenberg 2023).

Another important aspect is that programming itself is becoming democratized, in the sense that it is possible for widely available LLMs to help human programmers build entire complex applications. Using natural language for “vibe coding” can speed up development, while opening up the creation of immersive applications to a much wider set of people than ever before (Cloudflare 2025; Gallagher 2020). Only rudimentary aspects of programming are required, such as an understanding where a function begins and ends and the organisation of programs into files.

Immersion

Interaction within XR environments is driven by three psychological principles that create the immersion that defines spatial computing. These will be discussed in depth in the next section. But in brief, presence refers to the user’s subjective feeling of being physically situated in the virtual environment. Immersion encompasses the technological aspects that enhance this feeling, such as field of view, stereoscopy, spatial audio, update rate, latency, haptic feedback, olfactory cues, and tracking. All these affordances significantly enhance the believability of virtual experiences (Bailenson 2018; Heller 2020a).

Connectivity and Infrastructure

XR platforms depend on robust network infrastructure to deliver real-time, high-fidelity experiences. Low-latency networks, particularly those enabled by 5G, are essential for supporting the data-intensive demands of XR (World Economic Forum 2023). Cloud computing and edge processing further enhance performance by offloading complex computations to remote servers, enabling devices to remain lightweight and user-friendly (IEEE 2022; World Economic Forum 2023).

2.2 Key Psychological Features of XR

Spatial computers do not work in the same way as flat-screen traditional personal computers or smart phones. The difference in how these XR devices operate is important because it leads to different ways our brains engage with immersive media. In particular, three psychological characteristics explain why XR feels so very real.

Presence

Presence describes the psychological state in which users perceive a virtual environment as their immediate reality. This is often described as the “illusion of non-mediation,” where users feel as if they are physically present within the XR space (Bailenson 2018). This sense of presence is

crucial to creating realistic experiences in VR or MR. Users experience a disconnect from the real world and engage with the virtual one as if it were a physical space due to factors like high-quality graphics, high frame-rate of images in an XR headset, real-time responses, and synchronization of visual, auditory, and tactile stimuli (Gonzalez-Francy and Lanier 2017). Presence creates a profound effect, making users believe they are part of the virtual world, which has significant implications for how they experience content, including social interactions, threats, or expressions of opinion (Sánchez-Vives and Slater 2005).

The term “presence” has also been deconstructed into two independent components (Slater 2009). The first is the sense of “being there” in the place depicted by the displays, as described above, referred to as “place illusion.” The second, “plausibility,” is the illusion that events that are occurring in the virtual scene are really happening. While place illusion relies on the mode of perception that the system offers (i.e., reproduces natural sensorimotor contingencies where the participant perceives the virtual world by using their body and eyes as they do in reality), plausibility relies on interaction, meaning that the virtual world responds to the participant’s actions and that it conforms to various application-specific expectations (Sánchez-Vives and Slater 2005). Place illusion and plausibility together can lead to participants automatically acting realistically within the virtual environment, in spite of participants knowing for sure that nothing real is happening (Wiesing et al. 2025). In AR/MR the sense of “being there” is replaced by the illusion that virtual objects introduced into a real scene are actually present. This also relies on perception through natural sensorimotor contingencies, meaning that virtual objects can be viewed, heard, or touched as if they were real (Wiesing et al. 2025).

Immersion

A defining feature of XR is immersion, which refers to the extent to which a virtual environment engages the user’s senses, setting the scene “inside” the digital world (Sánchez-Vives and Slater 2005). Unlike traditional media, XR creates a sensory-rich experience where users interact with the virtual world using multiple senses. A fully immersive experience might involve users seeing, hearing, and even smelling virtual objects through device-based sensory feedback. The user’s sensory engagement enhances the feeling that the virtual environment is real, which can make the impact of virtual events, both positive and negative, much more intense ((Slater and Banakou 2021). For instance, a peaceful or violent interaction in an immersive environment can elicit strong emotional reactions similar to real-world experiences; one avatar yelling and invading another’s personal space will elicit reactions of fear and anxiety (Bailenson 2018). A corollary of this is that people may confuse experiences in VR with those in reality: taking virtual objects as real and drawing information from VR to solve problems in the real world, even though there is no actual connection between the two (Wiesing et al. 2025).

Embodiment

Embodiment is another critical aspect of XR, where users adopt digital avatars or representations that reflect their physical or chosen identities. This experience is enhanced by technologies that replicate users’ movements, gestures, and facial expressions in real time (Matamala-Gomez et al. 2019).

Research has shown that embodiment can lead users to feel a sense of ownership over their avatars, further blurring the line between physical and digital realities (Bailenson 2018; McGill et al. 2021). While this can foster creativity and inclusivity, it also introduces privacy risks, as a user can be personally identified by their movement. In other words, the data collected to enable real-time embodiment, such as motion tracking and biometric inputs, may be as personally identifying as your fingerprint (Nair et al. 2023). This includes telemetry data, like the way you tilt your head

and point, which was previously not seen as personally identifying information but is powerful enough to uniquely identify one person out of 55,000 (Nair et al. 2023). Similarly, personal data collected by XR devices is ripe for behavioural profiling; raising significant ethical and regulatory concerns about how the lack of anonymity in XR may impact freedom of expression (Council of Europe and IEEE 2024).

To a user's brain, this immersive-type of media feels like an actual reality, and not a virtual one. The experience is processed by the hippocampus, in the same way that memories are created (Heller 2020a). This process is quite different from reading web-based content or watching videos on a smartphone. It is what makes XR the most powerful and persuasive computing interface that humanity has developed.

Overall, these three features enable novel forms of expression, such as performing virtual protests or creating immersive artworks. However, they also expose users to novel risks, due to the feeling of actual reality. Addressing these risks requires not only technological safeguards but also policy measures that prioritize user safety without stifling creativity.

Embodiment is a powerful tool for enhancing prosocial attitudes and behaviours (Slater and Banakou 2021) and also in medical applications such as for pain relief (Matamala-Gomez et al. 2019). But it also affords the potential for body hijacking. In a shared VR or MR where multiple people meet, each with their own virtual body, some of the participants might be imposters. These imposters may have embodied someone else's body or used AI to simulate their voice and gestures. For example, someone might be having a discussion in VR with a person who seems to be a family member or trusted friend, but in fact not who they appear to be, and instead is a party who is thereby gaining valuable information (Oliva et al. 2025).

2.3 Emerging Trends in XR

Targeted advertising represents one of the most controversial trends in XR (Heller and Bar-Zeev 2021). By analysing users' biometric and behavioural data, such as eye movements, heart rate, and physiological responses, XR systems could potentially infer emotional states and preferences (Heller 2020b). This capability may enable highly-targeted personalized experiences, under a phenomenon called biometric psychography (Heller 2020b). But it can also open the door to manipulation. For example, platforms might use such data to deliver political, divisive or incendiary messages at moments when users are most emotionally susceptible, like allowing people to receive highly-personalized issue-based content at a political candidate's virtual rally in days leading up to an election (Heller 2020a; Abraham et al. 2022). This raises profound questions about mental privacy and whether existing protections under Article 10 of the European Convention on Human Rights (ECHR) are sufficient to address these challenges (Heller 2020a; Ienca 2017).

Generative AI is another transformative technology that can be combined with XR. As previously noted, it enables the dynamic creation of content tailored to individual users, from virtual environments to lifelike digital humans[1] (Tang et al. 2025). While these advancements enhance user experience, they also blur the line between authentic and synthetic interactions. For example, even before concerns about immersive content, experts warned that AI-driven avatars could be used to spread disinformation or manipulate users without their knowledge, complicating issues of trust and accountability (Bryson 2010). The basic indistinguishability of AI from human participants in XR spaces necessitates regulatory clarity on the roles and responsibilities of both

[1] Digital humans are AI-driven virtual characters designed to simulate realistic human appearance, behavior, and communication, often incorporating natural language processing, facial animation, and emotional responsiveness.

developers and users (Rosenberg 2023), or for industry standards to address the risk. The ability of conversational AI to engage in real-time, targeted interactions raises additional risks, as XR environments could serve as vectors for influence operations or misinformation campaigns (Brown, Bailenson and Hancock 2023).

Neurotechnology integration marks the cutting edge of XR innovation. State-of-the-art XR can run off gestures, eye tracking, or even vocal modulation to create movement and expressiveness. (Council of Europe and IEEE 2024). However, even this minimal level of human-computer interaction is rapidly changing toward a more embodied style of computing. Brain-computer interfaces (BCIs) and neurostimulation devices allow users to interact with computing environments through direct neural activity, but without invasiveness (Naddaf Drew 2024). While this offers groundbreaking opportunities for accessibility and communication, it also raises significant ethical concerns. Neurotechnology could facilitate involuntary data collection about users' thoughts or intentions, challenging foundational concepts of mental privacy and autonomy (Yuste 2021). The potential combination of neurotech and XR surfaces illustrates the need for proactive regulatory measures, including frameworks for neurorights. (Council of Europe and IEEE 2024).

2.4 Governance Challenges in XR

The fragmented nature of XR ecosystems presents a significant governance challenge, which may have cascading impacts on freedom of expression. Most platforms operate in silos, with limited interoperability between systems. This lack of standardization restricts users' ability to transfer their digital identities, content, or assets across platforms, raising concerns about digital identity ownership and portability (World Economic Forum 2023). Without clear guidelines for cross-platform interoperability, the potential for inequities and exclusions in XR spaces increases.

Surveillance and data exploitation represent another key issue that may impact how free individuals or communities feel to express themselves. XR technologies generate vast amounts of sensitive data, including biometric and geolocation-based information, often controlled by a small number of corporations (Rosenberg 2023). Although frameworks like the GDPR provide some safeguards, their applicability to XR's unique data landscape is very likely, but legal uncertainty still remains (General Data Protection Regulation 2016). Cross-border data flows and jurisdictional complexities further complicate enforcement, necessitating international collaboration to ensure robust privacy protections. As noted by experts during the CDMSI consultations, this fragmentation reflects not only differing legal traditions but also uneven capacity among member states to address cross-border data governance and moderation in immersive environments.

Pervasive data capture in immersive environments can also produce a chilling effect on expression, even in the absence of direct censorship. When biometric or behavioural profiling allows inference of identity or opinion, the resulting surveillance dynamics may alter how freely users engage or self-represent. Recent work on visceral notice and embodied data awareness has argued that users should understand when their sensory or expressive inputs are monitored or modified, as a safeguard for autonomy and freedom of expression (Heller 2020a).

XR's capacity for real-time sensory manipulation introduces risks of covert influence and behavioural control (Rosenberg 2023; Brown, Bailenson and Hancock 2023). Unlike traditional media, XR environments can dynamically alter users' perceptions, creating personalized realities that influence decision-making. For example, augmented reality applications can filter or distort visual information to shape users' opinions or actions (Schmidt and Engelen 2020). These

capabilities necessitate a reevaluation of existing legal frameworks to ensure they adequately address the risks of perceptual manipulation.

However, there is a dilemma, that while regulation is clearly absolutely required, it cannot be such that it undermines the functioning of the critical dimensions mentioned above: presence and body ownership. As a simple example, suppose that an LLM avatar used, for example, in a therapeutic setting were to continually announce “I am an AI.” Or perhaps virtual human avatars constituting a crowd in a street scene for training people to safely cross the road might all have signs on them indicating “I am not real.” This demarcation would clearly undermine the purpose of the application. So, regulation is necessary but should take into account the unique features of immersive systems.

In governing XR environments, a growing body of policy and technical research converges on an outcome-based approach. Rather than prescribing specific architectures or design parameters, effective frameworks define human-rights objectives such as perceptual integrity, accessibility, and transparency. They also allow flexibility in how these are achieved. This orientation enables innovation while ensuring that technological standards and governance practices remain anchored in fundamental rights principles (IEEE 2024; Council of Europe and IEEE 2024).

3. Impacts of XR on Freedom of Expression

Extended reality (XR) technologies hold immense potential to transform freedom of expression by enabling novel forms of creativity, advocacy, and communication. However, their immersive and data-driven nature also poses significant risks, such as heightened surveillance, censorship, algorithmic bias, and the psychological effects of immersive misinformation and harassment (Council of Europe and IEEE 2024; Cristea 2024). This section explores both the opportunities and challenges of XR, incorporating insights from a range of studies and reports.

3.1 The Importance of Freedom of Expression

Freedom of expression holds deep historical roots in European law, evolving significantly alongside societal shifts and technological advancements. Initially grounded in post-war Europe’s commitment to democratic freedoms, Article 10 of the European Convention on Human Rights (ECHR) was adopted in 1950 to enshrine freedom of expression as a fundamental right (Council of Europe 1950; European Court of Human Rights (2024). This right, reflecting the pressing need to protect open discourse and counteract censorship, was further strengthened as European nations democratized and integrated human rights into their constitutional frameworks (Macovei 2004).

In response to technological advancements and the rise of mass media, the European Court of Human Rights (ECtHR) expanded the interpretation of Article 10 to include diverse forms of expression across traditional media outlets such as newspapers and broadcast channels. However, with the rapid growth of the internet and social media in the late 20th and early 21st centuries, European courts faced new challenges in balancing freedom of expression with competing rights, such as privacy and data protection. During this period, landmark cases shaped the Court’s approach to balancing public interest and individual rights online. Notable examples include *Delfi AS v. Estonia*, App. No. 64569/09 (Eur. Ct. H.R. 2015) and *MTE & Index.hu Zrt v. Hungary*, App. No. 22947/13 (Eur. Ct. H.R. 2016), which addressed intermediary liability for third-party comments on news sites, illustrating the complexities of applying Article 10 protections in a digital context where information flows instantaneously and globally.

As social-media platforms became primary spaces for public discourse, ECHR jurisprudence on freedom of expression evolved to address misinformation, hate speech, and algorithmic amplification. The Court's rulings now reflect the increasingly nuanced standards needed to manage expression in these decentralized digital arenas, balancing the necessity of free speech with considerations of public safety, national security, and individual dignity, as reflected in cases such as *Von Hannover v. Germany (No. 2)*, Apps. Nos. 40660/08 and 60641/08 (Eur. Ct. H.R. 2012), and *Beizaras and Levickas v. Lithuania*, App. No. 41288/15 (Eur. Ct. H.R. 2020).

Nevertheless, freedom of expression is not an unrestricted right. Article 10(2) acknowledges that certain limitations may be imposed, provided they are "necessary in a democratic society" and serve legitimate aims, including the protection of national security, public safety, prevention of crime, and safeguarding the rights of others (Macovei 2004). Such limitations must ensure a balanced approach that respects both individual freedoms and societal interests. The ECtHR has extensively developed these principles through its case law, particularly regarding traditional media outlets and, more recently, online platforms and social media.

The application of these restrictions must be proportionate, and any interference with the right to freedom of expression must pursue a legitimate aim while maintaining a balance between individual rights and public interests. Case law of the ECtHR has consistently affirmed that any restrictions on expression must meet the criteria of legality, necessity, and proportionality (Macovei 2004; *Big Brother Watch v. United Kingdom* [GC], Apps. Nos. 58170/13 et al., Eur. Ct. H.R. 2021). In the context of traditional media such as newspapers, television, and even social-media platforms, these principles have been well developed through jurisprudence. However, with the advent of XR technologies, which enable users to engage in deeply immersive and interactive environments, the legal landscape faces unprecedented challenges, requiring careful re-examination of how these principles apply to such novel contexts.

The immersive affordances of XR, meaning its capacity to reproduce perception, emotion, and social proximity, may intensify both the reach and the impact of expression. This suggests that the proportionality analysis under Article 10(2) must evolve to account not only for the content of speech but also for its experiential amplification, or how embodied environments can heighten persuasive or harmful effect (Heller 2020a; Sánchez-Vives and Slater 2005).

As digital technologies have developed, the concept of freedom of expression has evolved. Traditional protections, once applied to physical spaces like public forums and print media, now extend to the digital realm, including online platforms and social media (*MTE & Index.hu Zrt v. Hungary 2016*). However, the emergence of extended-reality technologies presents new dimensions for this right. In immersive environments, the lines between content creator, audience, and platform become increasingly blurred, challenging existing legal interpretations of speech, association, and access (Heller 2020a).

In these environments, expression is not limited to written or spoken words but can take the form of interactive and immersive experiences, including avatar representations, simulated environments and experiences, and augmented interactions. Behaviours and environments are as expressive as speech. Therefore, the importance of protecting freedom of expression in XR is paramount, particularly as these technologies become more integrated into everyday life and are used for political, cultural, and social purposes (Council of Europe and IEEE 2024).

The importance of safeguarding freedom of expression in XR environments is underscored by the potential of these technologies to transform communication, social interaction, and cultural representation. As XR becomes integrated into everyday life for uses that span from social engagement to political expression, the need for clear, adaptable legal protections grows. XR's

unique ability to facilitate “experiential” speech (Dawley and Dede, 2014), where users can engage in scenarios or perspectives different from their own, may expand the possibilities of discourse, empathy, and understanding in unprecedented ways.

Protecting freedom of expression is critical to ensuring that XR does not become a medium for unchecked control or censorship but instead a tool that enriches public debate, diversity and cultural exchange, and individual self-expression (Hine et al. 2024). To achieve this, the ECtHR and other bodies may need to revisit and potentially adapt the conventional boundaries of free expression, balancing the transformative potential of XR with the legitimate interests outlined in Article 10(2). Such efforts will be essential for aligning emerging technologies with fundamental democratic values, ensuring that the protections afforded by freedom of expression remain robust and relevant in the digital age.

3.2 Opportunities for Freedom of Expression

XR enables unprecedented opportunities for freedom of expression, expanding the boundaries of creativity and enhancing the inclusivity of public discourse. By allowing for embodied, multisensory communication, XR offers transformative tools for self-expression, advocacy, and storytelling.

Transforming Creative and Social Expression

XR technologies facilitate new forms of artistic and cultural expression by merging physical and virtual environments. For example, immersive storytelling in journalism has been used to recreate historical events and simulate the experiences of refugees, enabling audiences to engage with issues on a deeper, more empathetic level (Gallego Abellán et al. 2024; Iñárritu 2017). Artists, too, have leveraged XR to create multisensory installations and interactive virtual exhibits, democratizing access to creative platforms (Dick 2021).

Moreover, XR enables cross-cultural dialogue by connecting users in shared virtual spaces, fostering understanding and empathy among diverse communities (Innocente et al. 2023). Virtual protests and global assemblies organized through XR platforms have demonstrated the medium’s capacity to amplify marginalized voices, bypassing traditional barriers to participation. In addition, the increasing availability of AI-powered live translation and live captioning erodes language barriers and enables cross-cultural expression (World Economic Forum 2024).

Enhancing Civic Engagement

XR can enhance the capacity of governments. It is being adopted for political expression, with platforms facilitating virtual town halls, policy simulations, and immersive awareness campaigns. These applications broaden access to civic participation and provide innovative tools for advocacy, particularly in geographically isolated or politically repressive regions (Gonzalez-Franco and Lanier 2017). Jurists have begun to hold hearings in the virtual XR courtrooms in China and Colombia, and Barbados has established a diplomatic embassy in the metaverse. Metaverse Seoul is South Korea’s XR civic engagement space, allowing citizens to access many types of administrative and government services (Seoul Metropolitan Government 2023).

3.3 The Collaborative Creative Potential of XR

As described in Section I, XR is fundamentally reshaping the boundaries of human interaction and expression. Unlike traditional digital platforms, XR immerses users in environments that merge physical and virtual spaces, allowing for embodied experiences that transcend textual, visual, or auditory communication. This transformative medium redefines freedom of expression

by expanding its scope beyond conventional frameworks, enabling multi-sensory engagement, real-time collaboration, and interactive storytelling (Kourtesis 2024).

The immersive nature of XR is a departure from linear modes of expression, introducing spatial and embodied dimensions that allow users to inhabit, manipulate, and co-create virtual realities. For instance, in XR, artistic creations are not merely viewed but experienced; social interactions are not confined to two-dimensional interfaces but unfold in dynamic, lifelike environments (IEEE 2024); and political engagement transcends geographical constraints, allowing virtual protests or policy simulations to potentially engage global audiences (World Economic Forum 2024). Such affordances position XR as an unprecedented medium for fostering creativity, social connectivity, and civic participation.

Critically, XR not only serves as a new platform for expression but also challenges established paradigms of how expression is understood, exercised, and regulated. By enabling users to express themselves through digital avatars, immersive environments, and augmented interactions, XR offers possibilities for identity exploration, empathy-building, and cultural exchange that were previously unimaginable (Schroeder 2018; Innocente et al. 2023). However, the same features that amplify expression also introduce complexities (Simpson and Conner 2021). Questions about access, inclusivity, and the ethical – but also legal - governance of these spaces underscore the need for nuanced analysis, particularly within the framework of European human rights law.

This segment of the report aims to explore the opportunities XR provides for enhancing freedom of expression across three interrelated domains: creativity, social interaction, and political engagement. The first section examines how XR has transformed the artistic process, from democratizing creative tools to enabling multisensory storytelling and audience co-creation. The second section explores XR's capacity to foster interpersonal communication and global communities, with a particular focus on identity experimentation and representation. The third section addresses XR's potential as a medium for political expression, highlighting examples of virtual activism, immersive awareness campaigns, and expanded civic participation.

Redefining Artistic Mediums

XR technologies fundamentally reshape artistic expression by introducing tools and environments that transcend the limitations of physical and two-dimensional mediums. Artists now can create and share works that exist exclusively in virtual spaces, offering audiences interactive and multisensory experiences that were previously unattainable.

Platforms such as *Tilt Brush* and *Gravity Sketch* exemplify XR's ability to facilitate the creation of three-dimensional, immersive artworks (Google 2021; Gravity Sketch Ltd. 2025). These tools allow artists to design spatial pieces that audiences can navigate, manipulate, and experience from multiple perspectives (Pangilinian et al. 2021). Unlike traditional sculptures or paintings, XR artworks often require active participation, shifting the role of the viewer from passive observer to engaged participant. For instance, works created in *Tilt Brush* can be displayed in virtual galleries, where audiences can explore the artistic process in real-time, further blurring the boundaries between creation and reception (Google 2021).

Another example of a developing XR technology is *The Virtual Online Museum of Art* (VOMA 2025). VOMA provides a salient example of how XR democratizes access to cultural spaces. Unlike traditional museums, which are constrained by physical space and geographical location, VOMA offers a fully virtual platform that allows audiences from around the world to experience curated exhibitions. These galleries are not merely replicas of physical spaces but dynamic

environments that adapt to audience interaction (VOMA 2025). By enabling global accessibility, VOMA aligns with the principles of cultural rights under Article 15 of the International Covenant on Economic, Social and Cultural Rights, reinforcing the relationship between XR and freedom of expression in the digital age (UN General Assembly 1966).

Immersive storytelling is another domain where XR technologies demonstrate their transformative potential. Alejandro G. Iñárritu's *Carne y Arena* (2017), an award-winning VR installation, places participants in the perspective of migrants crossing the U.S.-Mexico border. The combination of haptic feedback, environmental cues, and visual immersion fosters an emotional and empathetic connection that transcends traditional storytelling methods (Iñárritu 2017). Such projects illustrate how XR enables creators to challenge societal narratives and engage audiences in experiences that are as participatory as they are reflective.

Democratization of Creativity

The democratization of creativity refers to the process by which access to the tools, platforms, and spaces necessary for artistic production becomes more equal and accessible to a wider, more diverse range of individuals (Miller and Kirkpatrick 2012; Pangilinan et al. 2021). In the context of XR technologies, the democratization of creativity involves providing access to immersive tools such as XR headsets, collaborative virtual platforms, and user-friendly webXR software that allow anyone, regardless of their background or resources, to engage in artistic creation, exhibition, and consumption. Traditional artistic practices often require significant investment in both time and resources, from acquiring physical materials to gaining access to training and institutional support (García and Fernández 2024). In contrast, XR tools are increasingly accessible, offering creators without technical expertise or substantial financial resources the ability to produce professional-quality art.

Previously mentioned platforms like *Tilt Brush*, *Gravity Sketch*, and *Horizon Worlds* exemplify this shift. These tools allow users to create three-dimensional, immersive art using intuitive interfaces that do not require prior knowledge of advanced digital design software or hardware. For instance, Tilt Brush enables users to paint in a 3-D space with virtual brushes, offering an entirely new mode of creation that would not be possible in a traditional studio. Similarly, Gravity Sketch allows for the creation of intricate 3-D models and designs that can be explored from all angles, democratizing the space traditionally occupied by specialized 3-D modeling software.

In terms of accessibility, these platforms can be used by anyone with access to basic XR hardware, and even mobile devices, making them affordable alternatives to conventional artistic tools and studios. Moreover, online tutorials, community-driven resources, open-source platforms and collaborative features make tools like these even more accessible, providing a global space for learning, sharing, and co-creating.

Uplifting Marginalized Voices

XR technologies provide marginalized and underrepresented communities with the opportunity to express their voices, share their stories, and engage in cultural production that may otherwise be excluded from traditional art forms. For instance, indigenous communities and refugees have used VR platforms to document and share their experiences, creating digital archives and cultural expressions that would otherwise remain largely inaccessible (Hawkins and Johnson 2021). Through platforms like these, creators from marginalized backgrounds can exhibit their work to global audiences, effectively bypassing traditional gatekeepers such as galleries, curators, and institutions.

This process not only democratizes access to the arts but also enables marginalized groups to participate in global cultural conversations. By giving people, the tools to create immersive and interactive art, XR empowers communities to represent themselves authentically and challenge societal narratives that might otherwise marginalize their perspectives.

Projects such as *Clouds Over Sidra*, a UNHCR-supported virtual-reality documentary that immerses viewers in the life of a Syrian refugee girl, and Meta's "VR for Good" initiatives demonstrate how immersive storytelling can amplify the voices of people in marginalized or crisis contexts (MIT Open Documentary Lab, 2015). *Clouds Over Sidra* allowed users to experience refugee journeys firsthand, enhancing empathy and understanding for displaced populations. This type of immersive engagement can lead to greater awareness, advocacy, and policy change, illustrating how XR not only democratizes artistic creation but also fosters social change. Gallego Abellán et al. (2024) found that when people immersively shared the experiences of young undocumented migrants via immersive 360-degree VR, this experience fostered greater understanding towards the migrants' plight, as compared to seeing the same material on a 2-D display (Gallego Abellán et al. 2024).

Collaborative Creation

Another critical aspect of the democratization of creativity in XR is the collaborative nature of many platforms (Sudano 2024). Platforms like *Horizon Worlds* and *VRChat* allow users from around the world to engage in co-creation, merging their ideas, skills, and cultural backgrounds in a shared virtual space (Meta Platforms, Inc. 2025; VRChat Inc. 2025). This collaborative model is at odds with traditional artistic practices, which often emphasize the solitary artist, working in isolation.

In XR, the boundaries between creator and audience can blur. Viewers can become participants in the creative process, contributing to the development of virtual worlds, gaming environments, or art installations. (Sudano 2024). This fluidity of roles fosters an environment where creativity is not confined to a few "gatekeepers" but is instead a collaborative, community-driven process (Schroeder 2018; Sudano 2024). Experts in CDMSI consultations highlighted that these participatory environments could democratize creativity, enabling individuals to co-create and express ideas through shared virtual spaces that transcend physical boundaries. This shift has the potential to radically alter not only how art is made but also how it is consumed.

Global Accessibility and Inclusivity

XR platforms facilitate global access to artistic creation, enabling individuals from around the world to engage with and contribute to the global cultural conversation. Unlike traditional art forms that are often limited by geographical and economic constraints, XR provides an open-access model that allows artists from remote or economically disadvantaged regions to participate in the international art scene (Sanz-Prieto et al. 2024).

3.4 Risks to Freedom of Expression in XR

While XR technologies hold great promise for enhancing freedom of expression, they also present significant risks that, if unaddressed, could undermine this fundamental right. The immersive nature of XR environments, coupled with extensive data collection and algorithmic mediation, creates novel challenges for legal frameworks and governance. These risks are not confined to technical or operational issues, they also intersect deeply with human rights concerns, affecting how individuals communicate, create, and engage in virtual spaces (Grippo 2024). While the Council of Europe has previously adopted recommendations on traditional social-media

environments, the same normative tensions around moderation, autonomy, and proportionality now emerge in extended-reality systems. This section explores these risks in detail, emphasizing their implications for safeguarding freedom of expression in XR environments.

The discussion begins with the challenges of:

1) Censorship and content moderation, focusing on the unique complexities of moderating immersive, real-time interactions;
2) Surveillance and privacy concerns, particularly the extensive collection and use of biometric data;
3) How XR amplifies traditional harms like misinformation and harassment, creating new dimensions of risk;
4) Intellectual property issues and legal uncertainties that could chill creativity and collaboration;
5) Equity and accessibility barriers, notably how economic and design limitations restrict participation in XR;
6) The implications for identity and self-expression, in terms of both the opportunities and the risks XR presents for marginalized groups;
7) Finally, XR's role in political expression and activism, assessing its potential to empower civic engagement while considering the legal and ethical challenges it introduces.

Censorship and Content Moderation Challenges

Moderating XR environments is inherently more complex than moderating traditional digital platforms. XR interactions involve spatial architecture, environmental features generated by users, and behavioural expressions that blur the lines between traditional conceptions of speech and conduct (Hinduja and Patchin 2024; Council of Europe and IEEE 2024). These nuances exceed the content and conduct layers of moderation seen in flat-screen social media platforms.

Volunteer-based content moderation has been suggested as a solution for XR platforms. While this empowers communities, it creates significant challenges. Mistakes by volunteer moderators often leave users with little recourse, as moderation decisions are ephemeral, and the right to appeal is limited (Hinduja and Patchin 2024). This approach operates more like real-time refereeing than traditional moderation and fails to address systemic moderation issues. The alternative, namely recording all XR interactions and making them justiciable by platforms, is neither feasible, due to data storage limitations, nor desirable, as it would create severe privacy risks (Heller 2020b; Nair et al. 2023).

Automation for XR content moderation is similarly immature. Existing tools designed for text and video are ill-suited for the behavioural and spatial contexts of XR. Current systems often convert audio to text and process it using frameworks intended for flat-screen environments, losing the behavioural context needed to understand immersive scenarios. This crude approach increases the likelihood of over-moderation or, conversely, allows harmful content to proliferate.

The lack of advanced computer vision and AI systems further exacerbates these issues, especially for persons with disabilities. Effective real-time moderation in XR requires environmental responsiveness and adaptability, but the datasets needed to train such systems for XR's complexity are limited. Additionally, the computational resources required to support spatial moderation systems may divert resources away from accessibility features, potentially leaving users with disabilities, both apparent and non-apparent, without necessary accommodations (Council of Europe and IEEE 2024; TechEthos 2024).Finally, to ensure that XR develops and operates as an environment governed by the rule of law, it is essential to identify

rules and criteria for XR content moderation that are firmly grounded in human rights and democratic values, and to determine which actors - or automated or hybrid systems - should be entrusted with this role, while also ensuring that any human moderators or technical solutions are properly equipped to operate effectively in such a complex and multidimensional environment. Transparency of rules and criteria, human supervision, accountability and redress mechanisms are key to avoid abuse and rights infringement. This is where the Council of Europe may bring valuable input.

Surveillance and Privacy Risks

Some XR technologies rely on biometric and behavioural data collection, including eye movements, facial expressions, and physical gestures, to create immersive experiences. Unlike traditional platforms, XR's reliance on such data makes traditional opt-out schemes impractical for preserving privacy. This data is inherently sensitive, with studies confirming its personally identifiable nature (Nair et al. 2023). Developers of early XR headsets have even likened the technology to polygraphs, given its ability to capture subconscious reactions (Heller 2020a).

The potential misuse of this data extends beyond private corporations to state actors. For example, researchers have expressed concerns about significant investments in gaming technologies by the government of China, which could risk integrating biometric information into social profiles for younger demographics (National Endowment for Democracy 2024).

Consent in XR environments is another significant challenge. By design, XR devices can inadvertently capture data from non-users, including bystanders in public spaces. This not only exposes non-users to privacy violations but may also create a chilling effect on freedom of expression, as individuals fear being recorded without their knowledge (TechEthos 2024).

Fear of surveillance and data exploitation represents another key issue that may influence how freely individuals or communities express themselves. As discussed in Section 2, pervasive data capture in immersive environments can indirectly suppress expression by prompting self-censorship and creating a chilling effect when users believe that their embodied interactions are being observed or analyzed. These dynamics illustrate how privacy concerns and awareness of observation can shape expressive behaviour in immersive settings, highlighting the importance of transparency and user trust as conditions for meaningful participation (*Big Brother Watch v. United Kingdom* [GC] 2021). In this regard, legal and practical/technical safeguards are of vital importance.

Amplification of Immersive Harms

The immersive nature of XR heightens the psychological impact of traditional internet-based harms such as misinformation and harassment. Immersive misinformation, for example, can create hyper-realistic simulations of false events, manipulating users' perceptions and beliefs. Experiments at Stanford University's Virtual Human Interaction Lab demonstrated how XR simulations can create "misexperience," presenting fabricated content as reality, in this case replicating the first moon landing while placing it within a sound stage (Brown, Bailenson and Hancock 2023).

Harassment in XR also takes on new dimensions. Behaviours such as unwanted proximity or simulated assaults can feel as invasive as physical-world violations. Reports of sexual harassment in XR environments date back to 2016, and cases involving women and girls have highlighted the severe psychological impact of such incidents (Belamire 2016; Basu, 2021; Zitser

2022). For instance, the U.K. Public Prosecution Service recently opened an inquiry into a minor's claim of sexual abuse in the metaverse (Nachiappan 2024).

Harassment in XR also takes on new dimensions, as expressive behaviour occurs through gestures, proximity, and shared spatial presence. Automated moderation systems developed for text-based or two-dimensional platforms often struggle to interpret such embodied interactions accurately. To address these limitations, hybrid moderation models that combine automated detection with human contextual review are emerging to distinguish harmful conduct from legitimate expressive acts. Research on digital-civility interventions and immersive behaviour supports this dual-layer approach to mitigate abuse while reducing the risk of over-removal of protected expression (Hinduja and Patchin 2024). Research indicates that harassment disproportionately affects women, minorities, and others at-risk for discrimination. A study on metaverse risks among U.S. youth found that while boys and girls experienced similar rates of hate speech, bullying, and exposure to violent or sexual content, girls were far more likely to be targeted for sexual harassment and grooming (Hinduja and Patchin 2024). To mitigate these risks, some users intentionally choose avatars less likely to attract harassment or employ tools to maintain safe distances from others. However, these strategies may limit their ability to engage fully in XR spaces (Outlaw 2018).

Intellectual Property Complexities in XR

The emergence of XR technologies introduces novel challenges to intellectual property (IP) frameworks, which directly influence freedom of expression. Authorship in XR often involves multiple contributors, including platform developers, software designers, and users, complicating the traditional legal paradigms of copyright (Hayes 2016; Lemley and Volokh 2018). For example, dynamic interactions in applications like *Tilt Brush* raise questions about whether creators retain full copyright over their work or if participants acquire derivative rights. Similarly, modifications in virtual worlds may blur the line between permissible alterations and derivative works, leaving creators uncertain about their ability to control the use of their creations (Lemley and Volokh 2018).

Enforcement of IP rights in XR is further complicated by jurisdictional issues. Virtual artworks that exist on global platforms may be subject to conflicting legal standards, as seen in scenarios involving creators in one jurisdiction, platforms in another, and users in yet another. While the Berne Convention provides baseline protections, its principles fail to account for the evolving and intangible nature of XR creations (Berne Convention 1979).

Equality and Accessibility Barriers

Access to XR technologies often requires expensive hardware and high-speed internet, creating barriers for users. These inequities influence who can participate, what and how widely ideas circulate in immersive environments, linking economic capacity and infrastructure to the exercise of freedom of expression. They also intersect with broader equality concerns under Council of Europe instruments, where factors such as connectivity, language localization, and accessibility for persons with disabilities determine whether participation in XR is inclusive or exclusionary (Council of Europe, CM/Rec (2022) 13; European Convention on Human Rights, Article 14). The ECHR Article 14 does not create a free-standing right but prohibits discrimination in the enjoyment of rights guaranteed by the Convention, including Article 10's guarantees of freedom of expression. From this perspective, unequal access to digital or immersive technologies that enable expression, or participation may potentially amount to indirect discrimination among users.

These barriers also conflict with the Charter of Fundamental Rights of the European Union Articles 21, 22 and 26; the inclusive goals of Article 15 of the ICESCR, which emphasizes equal access to cultural and artistic life; and Articles 15 and 30 of the European Social Charter (1996).

Early XR hardware further presented significant design barriers for women, religious minorities, and persons with disabilities, resulting in exclusion from immersive spaces (Heller 2022b). Addressing these gaps requires inclusive design principles and sustained investment to bridge the digital divide.

Implications for Identity and Self-Expression

XR environments enable users to explore and express their identities through avatars and virtual personas. For marginalized groups, XR offers a platform for self-expression and community building, often free from real-world discrimination. However, this freedom is tempered by risks such as identity theft, misrepresentation, and harassment, which can undermine users' ability to safely engage in XR spaces (Hinduja and Patchin 2024; Outlaw 2018).

Targeted harassment based on identity impacts users' willingness to embody themselves authentically in XR, stifling their freedom of expression. Ensuring that anti-discrimination protections extend to virtual spaces is critical to safeguarding these rights.

Political Expression and Activism in XR

XR technologies have become a powerful tool for political activism and civic engagement, allowing users to organize protests and advocate for change in ways that transcend physical barriers. For instance, virtual protests on XR platforms can amplify marginalized voices and provide anonymity to those in oppressive regimes. However, such activities face challenges under Article 10 ECHR, particularly in balancing freedom of expression with public order and national security concerns (European Convention on Human Rights).

The lack of legal precedents addressing XR-specific activism introduces uncertainties about jurisdiction and liability. Platforms may impose content restrictions that curtail users' political expression, highlighting the need for careful application of Article 10 protections (European Convention on Human Rights). Additionally, XR's potential for empathy-building through experiential learning, such as simulations that humanize political issues, presents opportunities for innovative advocacy aligned with freedom of expression principles.

4. Policy and Legal Frameworks Governing XR and Freedom of Expression

XR technologies present transformative opportunities and profound challenges for legal and policy frameworks governing freedom of expression. While the CoE/IEEE report provides valuable guidance, it remains broad in scope, warranting more specific discussion around how to address XR-specific challenges related to freedom of expression. This section builds upon the basis of the CoE report and incorporates insights from other sources to propose a more comprehensive approach to a pro-freedom of expression regulation scheme for XR environments.

4.1 The European Convention on Human Rights (ECHR)

The European Convention on Human Rights is the foundational text for human rights protection across Europe and has profoundly influenced both national constitutions and international treaties (European Convention on Human Rights). Entered into force in 1953, the ECHR and its supervisory body, the European Court of Human Rights, have developed a rigorous standard for freedom of expression under Article 10. In addition, while legal concerns raised by immersive

technologies may fall more directly under other provisions of the Convention, these domains often intersect with the exercise of freedom of expression and must be examined accordingly. For instance, issues related to privacy, surveillance and data protection are more directly linked to Article 8 (right to respect for private life), while intellectual property and the ownership of digital assets are governed by Article 1 of Protocol No. 1 (protection of property) (1952). However, surveillance and insufficient data protection safeguards can interfere with Article 10, as recognised in ECtHR case-law (*Weber and Saravia v. Germany* (2006); *Big Brother Watch and Others v. the United Kingdom* [GC] (2021)). Likewise, excessive intellectual property restrictions may have a chilling effect on artistic and journalistic expression. It is therefore vital to highlight and preserve the relevance of Article 10 in these cross-cutting contexts.

Article 10 grants everyone the "right to freedom of expression", including the "freedom to hold opinions and to receive and impart information and ideas without interference by public authority". This principle is critical in sustaining democratic systems, ensuring that public discourse remains open, and supporting individual autonomy in forming and sharing ideas (European Convention on Human Rights).

During the consultations held under the CDMSI framework, it was emphasized that this principle reflects the Convention's role as a "living instrument", adaptable to emerging technologies such as XR. Participants noted that the Court's recognition of symbolic and non-verbal expression offers a foundation for extending Article 10 protections to embodied and immersive forms of communication.

However, the ECHR anticipates that freedom of expression can be limited under certain conditions, as specified in Article 10(2). The paragraph allows for limitations that are "necessary in a democratic society," contingent upon legitimacy, proportionality, and adherence to legal standards. Legitimate aims for such limitations include protection of national security, public safety, prevention of disorder or crime, and protection of others' rights. The ECtHR has developed substantial jurisprudence that operationalizes these standards, examining restrictions imposed by member states with careful scrutiny to prevent overreach that might stifle free speech unnecessarily.

The ECtHR has established key principles through its case law, particularly in landmark cases that interpret Article 10 in traditional and digital contexts. For instance, in *Handyside v. United Kingdom* (1976), the Court famously held that freedom of expression includes "information or ideas that offend, shock or disturb." This broad definition has underpinned the Court's stance on speech, reinforcing the need for tolerance in democratic societies. As demonstrated by the cases below, the Court's interpretation has gradually evolved, accounting for new forms of media, such as the internet, social media, and, more recently, emerging digital platforms.

Expressive Activities Online

The Court has recognised a broad range of expressive activities conducted online as falling within the scope of Article 10. These include:

- Maintenance of internet archives (*Times Newspapers Ltd v. the United Kingdom* (2009)); *M.L. and W.W. v. Germany* (2018); *Węgrzynowski and Smolczewski v. Poland* (2013); (*Hurbain v. Belgium* [GC] (2023));
- Publication of images on websites (*Ashby Donald and Others v. France* (2013);
- Use of mobile applications for political expression (*Magyar Kétfarkú Kutya Párt v. Hungary* [GC] (2020));

- Use of platforms like YouTube and Google Sites (*Cengiz and Others v. Turkey* (2015)); (A*hmet Yıldırım v. Turkey* (2012));
- Posting of hyperlinks to third-party content (*Magyar Jeti Zrt v. Hungary* (2018));
- Expression through the "Like" function on social media (*Melike v. Turkey* (2021));
- Sharing of third-party content via social media (*Kilin v. Russia* (2021)).

Symbolic or Embodied Expressions

The ECtHR has also confirmed that Article 10 protects symbolic and conduct-based expression. Protection has been extended to acts involving bodily presence, physical expression, and visual messaging:

- Public protest acts such as graffiti on statues (*Ibrahimov and Mammadov v. Azerbaijan*, 2020, §§ 166–167), obscene political sculptures (*Mătăsaru v. the Republic of Moldova*, 2019, §§ 29, 34), or paint attacks on historical monuments (*Murat Vural v. Turkey*, 2014, §§ 40–56);
- Symbolic nudity and artistic protest (*Gough v. the United Kingdom*, 2014, § 150; *Bouton v. France*, 2022, §§ 30–31);
- Political messages using physical gestures or symbolic disruption (*Shvydika v. Ukraine*, 2014, §§ 37–38; *Karuyev v. Russia*, 2022, §§ 18–20; *Tatár and Fáber v. Hungary*, 2012, § 36);
- Display of vestimentary symbols (*Vajnai v. Hungary*, 2008, § 47).

Liabilities of Digital Platforms

The Court has also addressed the responsibilities and liabilities of digital platforms in hosting and regulating user content:

- In *Delfi AS v. Estonia* [GC] (2015, § 159), the Court accepted that States may impose liability on internet portals for failing to remove extreme or manifestly unlawful content, such as hate speech or incitement to violence, even where posted by third parties.
- In *Magyar Tartalomszolgáltatók Egyesülete and Index.hu Zrt v. Hungary* (2016), the Court identified four criteria for assessing intermediary liability (§§ 60-88): (1) context and content of the comments; (2) liability of the authors of the comments ; (3) measures taken by the applicants (platform operators) and the conduct of the aggrieved party (4) consequences of the comments for the aggrieved party and for the applicants.
- In *Sanchez v. France* [GC] (2023, §§ 185–190), the Court addressed a politician's liability for third-party comments on his Facebook wall, underscoring the need for minimum moderation or filtering systems and emphasising the shared responsibility among platforms and account holders to prevent abuse.
- In *Big Brother Watch and Others v. the United Kingdom* [GC] (2021, §§ 447–450, 458), the Court found that the mass interception and storage of communications data requires strong legal safeguards. These safeguards are essential for protecting journalists and public discourse and have direct relevance for immersive environments where biometric and behavioural data are often collected.

Implications for XR Environments

The above cases demonstrate the Court's consistent position that Article 10 applies regardless of technological format. It follows that expressive conduct in immersive environments, whether visual, spatial, symbolic, or avatar-based, should fall under the protection of Article 10. The judgments also indicate that the Court recognises expressive conduct beyond verbal or written

forms. Immersive reality environments, through avatars, virtual attire, symbolic movements, or spatial interaction, enable similar symbolic expression. Even minimal gestures, such as a “like” on social media, may qualify as protected political expression. Analogous acts in immersive spaces should enjoy similar protection. In addition, the principles developed in these cases demonstrate that immersive expression is not exempt from liability frameworks and that both platforms and users in XR environments bear legal obligations in accordance with Article 10.

However, XR environments introduce unique complexities that may require recalibration of the principles articulated in the existing case law. These developments illustrate how the principles of proportionality, legitimacy, and necessity established under Article 10 are being tested by the realities of immersive environments. The Court’s evolving jurisprudence shows that applying these standards to embodied or data-intensive contexts will require close attention to how surveillance and biometric tracking affect expression. As XR technologies expand digital interaction into immersive environments, the ECtHR’s established frameworks may require further adaptation to account for expression that involves both physical presence and digital embodiment.

First, XR technologies increasingly rely on extensive data collection, including biometric information, to create personalized experiences. This raises the risk of overreach, where user activities, expressions, and interactions within virtual spaces are monitored or censored without adequate safeguards. Consequently, this highlights the urgent need for stringent frameworks to mitigate risks and uphold fundamental rights in these immersive settings. By applying and potentially extending the principles of proportionality, legitimacy, and necessity, the Court can ensure that freedom of expression is robustly protected while addressing the novel challenges posed by XR platforms. This evolving framework could be pivotal in preserving democratic values and individual autonomy in an increasingly interconnected and immersive digital landscape.

Future interpretative guidance may wish to distinguish between the intensity and reach of expression in XR when assessing proportionality. Expression that is embodied, immersive, or bio-responsive may require modified balancing tests that weigh physiological impact alongside intent, echoing the Court’s functional approach in *Handyside* and *Sanchez v. France (GC 2023)*. In immersive settings, the intensity and reach of expression can differ markedly from those in traditional media. Embodied or bio-responsive interactions may heighten emotional or persuasive impact, raising questions about how proportionality analysis accounts for these experiential effects.

Second, intermediary accountability becomes even more pronounced in XR platforms where harmful content can take new forms. The immediacy and immersive nature of XR interactions could amplify the impact of hate speech or harassment, necessitating robust and proactive moderation frameworks. At the same time, overly restrictive measures could stifle creativity and innovation, challenging the proportionality principle. Ensuring equilibrium will be critical to maintaining both safety and expressive freedoms within these environments.

Third, cases like *Barbulescu* underscore the need for transparency and proportionality in monitoring practices, which is particularly pertinent in XR, where data collection is integral to the user experience and the functioning of the hardware. The line between legitimate safety measures and intrusive surveillance may become blurred, raising questions about the adequacy of current safeguards under Articles 8 and 10 of the ECHR. Addressing these issues will demand innovative legal interpretations that remain faithful to established human rights norms.

Fourth, XR environments blur the boundaries between physical and digital experiences, creating scenarios where traditional interpretations of Article 10 protections may be insufficient. For example, how should the Court address expressions that are embodied in virtual spaces, such

as gestures, voice interactions, or avatar representations? These forms of expression may require new legal tests to determine their scope and limitations under Article 10. Developing such tests will be essential to ensure that users' freedoms are effectively safeguarded in XR.

Application of Article 10 in XR contexts also intersects - as it does offline - with other Convention rights, particularly Articles 8 and 14. Questions of privacy, surveillance, and equal access indicate that expressive harms may arise from discriminatory algorithmic design or unequal participation, requiring interpretation that reflects these interdependencies.

4.2 The EU Charter of Fundamental Rights

The EU's Charter of Fundamental Rights serves as a complementary, binding instrument within the European Union's jurisdiction, consolidating various human rights standards, including freedom of expression (Charter of Fundamental Rights of the European Union 2012). Article 11 of the Charter mirrors the protections enshrined in Article 10 of the ECHR, while explicitly guaranteeing the right to "hold opinions and to receive and impart information and ideas" and additionally safeguarding media pluralism. The inclusion of media pluralism reflects the EU's recognition of the essential role that diverse and independent media play in democratic societies. This principle has become increasingly pertinent in the context of digital platforms and could take on new dimensions in XR environments, where virtual spaces may become arenas for expression and information dissemination.

Given the Charter's binding status, particularly after the Treaty of Lisbon, it has been integral in shaping the EU's legislative approach to digital rights (Treaty of Lisbon 2009). The Charter's influence is evident in frameworks like the Digital Services Act (DSA) and the General Data Protection Regulation (GDPR), which both prioritize fundamental rights, including freedom of expression (General Data Protection Regulation 2016; Digital Services Act 2022). These frameworks address intermediary responsibilities and data privacy, concepts that are foundational yet increasingly complex in XR settings. For example, the DSA's focus on platform accountability could inform regulatory approaches to content moderation in XR spaces, where harmful interactions or misinformation might manifest in more immersive and impactful forms.

Article 52 of the Charter provides a legal basis for restricting freedoms, emphasizing that any restriction must respect the "essence of those rights and freedoms" and meet the criteria of legality, necessity, and proportionality (Charter of Fundamental Rights of the European Union 2012). As previously noted, this foundational principle will require nuanced interpretation in XR contexts, where the interplay between physical and digital presence might challenge traditional understandings of what constitutes a proportionate restriction. In immersive realities, the boundaries of individual expression could directly intersect with the rights of others in shared virtual spaces, necessitating a recalibrated application of proportionality to account for the heightened immediacy and interactivity of XR interactions.

In addition, in immersive environments, expressive acts can persist or be replayed indefinitely, extending their reach and potential impact. This persistence introduces a temporal dimension to proportionality analysis, as lasting visibility may intensify chilling effects and call for closer scrutiny of necessity and duration under Article 52 of the Charter.

The European Court of Justice (ECJ) has further interpreted Article 11 in key cases like *Glawischnig-Piesczek v. Facebook Ireland Limited* (2019), which dealt with intermediary liability and content removal on social media platforms. The ECJ allowed national courts to compel social media platforms to remove harmful content, setting a precedent for balancing individual expression with the prevention of harm. While this case focused on traditional social media

platforms, its principles are increasingly relevant to XR environments, where platforms exert even greater control over immersive user interactions and social XR environments are moderated. The concept of intermediary responsibility outlined in *Glawischnig-Piesczek* could guide how XR platforms address challenges such as virtual hate speech, misinformation, or harmful behaviours, ensuring that these spaces respect the essence of freedom of expression while maintaining user safety.

The principles held in the Charter and interpreted by the ECJ underscore the critical balance between safeguarding freedom of expression and addressing legitimate concerns such as harm prevention and platform accountability. While primarily developed in the context of traditional digital platforms, these legal frameworks provide a foundational lens through which the challenges posed by XR environments can be examined. As XR technologies blur the boundaries between digital and physical spaces, the established legal doctrines of proportionality, necessity, and intermediary responsibility will play a pivotal role in shaping the evolving landscape of rights protection within these immersive realities. This underscores the enduring relevance of fundamental rights frameworks in addressing emerging technological complexities.

4.3 Relevant Council of Europe Guidelines and Recommendations

The Council of Europe supplements its binding legal instruments with non-binding yet influential guidelines that address emerging issues related to freedom of expression, particularly in the digital sphere. Current guidelines, including *Recommendation CM/Rec (2022)13 on digital technologies and freedom of expression*, *Recommendation CM/Rec (2020)1 on algorithmic systems*, *Recommendation CM/Rec (2018)2 on the roles and responsibilities of internet intermediaries*, and the *Declaration on the Manipulative Capabilities of Algorithmic Processes (2019)*, as well as the 2021 *Guidance note on content moderation - Best practices towards effective legal and procedural frameworks for self-regulatory and co-regulatory mechanisms of content moderation*, were however not developed with immersive realities in mind and therefore do not yet fully cover XR specific concerns.

Recommendation CM/Rec (2018)2 on the roles and responsibilities of internet intermediaries provides a comprehensive framework emphasizing transparency, accountability, and the necessity for a balanced approach to content regulation. While originally designed for conventional online platforms such as social media, its principles can be extended to XR technologies. XR environments, which merge immersive interactions with complex data ecosystems, amplify challenges associated with content moderation. For example, the real-time nature of XR interactions and the creation of virtual spaces where users' actions may simultaneously resemble speech and behaviour complicate the application of traditional moderation principles. This adaptability raises critical questions about the limits of intermediary responsibility and the potential for liability within XR platforms.

The *Declaration on the Manipulative Capabilities of Algorithmic Processes (2019)* highlights the transformative role of algorithmic systems in shaping user experience. In XR environments, algorithms determine not only content visibility but also the immersive context in which users interact. These systems can alter perceptions of reality, raising concerns about their influence on autonomy and expression. For instance, the personalization of XR experiences may prioritise certain content or interactions, effectively curating what users see and engage with. This potential for algorithmic ranking poses a dual risk: curtailing users' exposure to diverse viewpoints and fostering echo chambers within immersive environments. The Declaration's call for transparency and accountability is particularly relevant here, as XR platforms must disclose the mechanisms through which algorithms shape user experiences to safeguard freedom of expression.

Recommendation CM/Rec (2020)1 on algorithmic systems establishes the need for oversight and explainability in the design and deployment of complex automated decision-making processes. Its principles apply directly to XR architectures that rely on AI driven moderation, ranking, or content generation.

Recommendation CM/Rec (2022)16 on combating hate speech provides guidance on prevention, education, victim support, and enforcement. Several of its operational safeguards are relevant to embodied and spatial expression in XR, including the need for context sensitive assessment and proportionate responses by platforms and authorities.

Recommendation CM/Rec (2024)4 on the impact of artificial intelligence systems on freedom of expression sets principles for transparency, accountability, and human oversight. These principles apply directly to XR environments that use AI for moderation, ranking, and generative content, and should guide assessments of how such systems affect the availability and visibility of expressive content in immersive settings.

Two forthcoming instruments are expected to extend these frameworks. The Draft *Recommendation CM/Rec (202X)XX on equality and artificial intelligence* will address discriminatory impacts arising from automated systems, which will be pertinent to XR when biometric and behavioural data are used for access control, identity inference, or content curation in ways that may affect equal enjoyment of freedom of expression. Likewise, the Draft *Recommendation CM/Rec (202X)XX on technology facilitated violence against women and girls* will be relevant where immersive environments enable harassment, stalking, or coerced imagery. Its prevention and remedy measures should inform platform duties and state obligations when such conduct occurs through avatars, spatial voice, or haptic features.

Taken together, these instruments illustrate the progressive adaptation of Council of Europe standards to new communication environments. Experts and stakeholders alike in CDMSI consultations agreed that extending these instruments to XR through interpretation and guidance, rather than new regulation, would best preserve coherence within the Council of Europe framework.

One analytical approach to safeguarding expression in immersive contexts is to examine how XR systems influence autonomy and expressive diversity before deployment. Assessments modelled on human rights impact analyses could help identify potential effects on perception, cognition, and participation at an early stage (Heller 2020a; Yuste 2021).

Aligning the analysis of immersive manipulation and algorithmic discrimination with ongoing Council of Europe initiatives, such as the *Gender Equality Strategy 2024–2029*, would reinforce the human rights foundations of XR governance. These evolving instruments collectively inform the analysis in Section 5 on potential future guidance for applying freedom of expression standards in XR.

5. Findings and Recommendations

Immersive technologies expand the spaces in which individuals communicate, create, and participate in public life. In these environments, expression itself becomes more complex, encompassing not only verbal or visual communication but also spatial interaction, gesture, movement, and other embodied or behavioural forms of expression. Such modes of communication blur traditional distinctions between speech, conduct, and experience, thereby challenging established analytical categories under freedom of expression standards. Their

embodied and interactive nature also raises novel questions relating to privacy, dignity, equality, and democratic participation - areas that existing governance frameworks only partially address.

The findings and recommendations presented in this study draw on successive stages of consultation conducted under the auspices of the Steering Committee on Media and Information Society (CDMSI). The feasibility study was first presented in December 2024 and subsequently updated following discussion at the CDMSI plenary in June 2025. Feedback from member States and insights from multi-stakeholder engagement were integrated into the revised version. A final expert workshop, held in Strasbourg in October 2025, reviewed the preliminary conclusions and refined the proposed next steps.

These consultations confirmed that the framework of the European Convention on Human Rights (ECHR), and in particular Article 10, provides a sufficiently adaptable basis for addressing freedom of expression in immersive realities. The Convention's "living-instrument" doctrine enables it to evolve alongside technological innovation and social transformation.

At the same time, further analytical and policy work within the Council of Europe is warranted to enhance understanding - without prejudging the interpretive authority of the European Court of Human Rights - of how established Article 10 principles and related soft law instruments are likely to operate in immersive environments.

Within this framework, the study identified several main areas for future work by the CDMSI and, potentially, the Council of Europe, on immersive realities:

1. Awareness-Raising: to strengthen awareness of the implications of immersive technologies for the exercise of freedom of expression and other fundamental rights and freedoms, the operation of rule of law principles and the protection of democratic values as promoted by the Council of Europe.

The CDMSI is encouraged to pursue targeted awareness-raising activities within the Council of Europe and among its member States concerning the benefits and challenges those immersive realities present for the enjoyment of freedom of expression, as well as of other rights and freedoms. Such activities may include thematic exchanges, workshops, and multi-stakeholder events – including the European Court of Human Rights, partner committees and other stakeholders – would aim at disseminating the findings of the feasibility study, strengthening institutional understanding, and supporting the development of human-rights - and rule-of-law-compliant approaches to XR technologies. These initiatives would also promote public awareness of how immersive technologies affect media pluralism, cultural diversity, and democratic participation.

Awareness-raising activities could further contribute to building judicial and regulatory capacity to interpret existing freedom-of-expression standards in XR contexts, ensuring consistent and rights-based approaches across member States.

2. Reviewing of existing Council of Europe freedom of expression standards for potential future guidance: to conduct a mapping of existing Council of Europe and other international standards in this emerging field, and an assessment of their relevance and sufficiency, in particular for the protection of freedom of expression.

The CDMSI could undertake a structured review of existing Council of Europe instruments and standards relating to freedom of expression, as well as of relevant international instruments, in order to assess their potential applicability to immersive realities. This would aim to determine

which instruments and principles remain adequate and where additional interpretive clarification or complementary guidance may be required.

This review could include, inter alia:

- Recommendation CM/Rec(2022)13 on digital technologies and freedom of expression;
- Recommendation CM/Rec(2020)1 on the human-rights impacts of algorithmic systems; and
- Recommendation CM/Rec(2018)2 on the roles and responsibilities of internet intermediaries.
- CDMSI 2021 Guidance Note on Content Moderation - Best practices towards effective legal and procedural frameworks for self-regulatory and co-regulatory mechanisms of content moderation

Based on its findings, the CDMSI could consider proposing updates or adjustments with a view to ensuring that the Council's soft-law framework continues to provide effective protection for freedom of expression as immersive technologies evolve. To promote a common and coherent approach to related challenges, and building on existing work and standards, the CDMSI could engage in the development of specific, up-to-date, and evolving guidance on safeguarding freedom of expression and other interconnected rights in immersive environments.

Strengthening Rule of Law and Human Rights Approaches in Global XR Governance: on a more general level, the Council of Europe is encouraged to actively engage in the broader international discussions on the governance of immersive technologies, contributing to these efforts with its distinctive human-rights, democracy, and rule-of-law perspective.

The international landscape for XR governance is evolving rapidly. International institutions, both from the public and the private sector, have begun developing instruments/frameworks focused on innovation, ethics, or cultural policy. However, few of these initiatives have been exploring in depth the implications of immersive technologies for freedom of expression and other fundamental rights, and the importance of rule of law principles. The Council of Europe is particularly well placed to help ensure, based on the ECHR and related case-law, that XR develops as a rule of law governed environment and that its instruments are authoritative benchmark for the protection of human rights and fundamental freedoms in this environment. This is instrumental in ensuring that no immersive space becomes an unsafe environment, subject to arbitrariness and vulnerable to abuse and rights violations.

Further research and policy dialogue are at the same time needed on questions such as jurisdiction, evidence, and enforcement in virtual environment, as well on the transnational dimensions of XR. Strengthening cooperation and promoting comparative-law exchanges among member States and international frameworks could help ensure the consistent application of freedom-of-expression and more generally, human rights principles and prevent legal fragmentation across jurisdictions.

Timely action is a key factor. Private-sector actors are already shaping *de facto* standards for content moderation, data governance, and identity management in immersive environments. Without an articulated, rights-based framework, such industry norms risk becoming entrenched before human rights principles are adequately defined.

The two tracks identified - awareness-raising and standards review - form a coherent basis for further intergovernmental and expert work on immersive realities within the Council of Europe. Initiating the awareness-raising and standards-applicability review within the next twelve to

eighteen months would be both pragmatic and strategic. Early engagement would enable the Council of Europe to provide coherent guidance to its member States, contribute meaningfully to global debates, and help avoid fragmentation between European and international governance regimes. This would be a further key step in the Organisation's contribution to aligning technological innovation and evolution with human rights principles and democratic values.

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Immersive technologies – virtual, augmented, and mixed reality (XR) – are transforming how people communicate, create, and interact. Their unique features of presence, immersion, and embodiment expand the possibilities for freedom of expression, but also introduce new risks to privacy, autonomy, dignity, and democratic participation.

This Council of Europe study examines how Article 10 of the European Convention on Human Rights applies to expressive conduct in XR. It identifies key challenges, including content and behaviour moderation, biometric data use, symbolic and artistic expression, and the adequacy of existing legal safeguards.

The study's purpose is to assess whether new guidance or instruments are needed to ensure that freedom of expression is effectively protected as immersive realities evolve, and to inform the Council of Europe's future standard-setting and policy work in this rapidly developing field.

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