

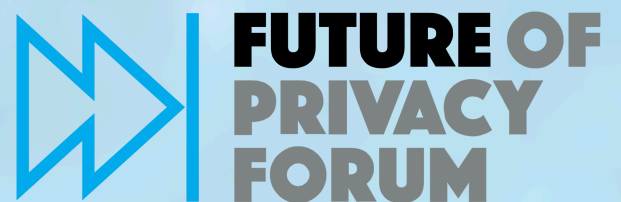
ISSUE BRIEF



Immersive Tech Panel Series Insights

From Health to Education and Beyond

Author: Jameson Spivack, FPF, January 2024



Authored By:

Jameson Spivack

Senior Policy Analyst for Immersive Technologies, Future of Privacy Forum

The insights in this issue brief are based on a series of panels hosted from July-December 2023, including the following experts:

Health & Wellness: Jordan Wrigley, Dr. Susan J. Persky, Jasmine Roper, Caroline Sindors

Advertising: Aaron Massey, Mark Brennan, Gabe Maldoff, Emily Yu

Vehicles: Adonne Washington, Michael Cole, Daria Fedko, David Goedicke

Education: Jamie Gorosh, Kaylee Brown, Nir Kshetri, Mark Milliron

AI: Amber Ezzell, Ellysse Dick, Karim Mohammadali, Michael Running Wolf

Kids & Teens: Bailey Sanchez, Dona J. Fraser, Dr. Elizabeth Milovidov, Dania Tanur

Acknowledgements:

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Executive Summary

Companies in sectors from healthcare to education and beyond are incorporating immersive technologies like extended reality (XR) and virtual world platforms into their products and operations, creating both opportunities for improved performance and risks to privacy. To explore some of immersive technologies' major applications, in 2023 the Future of Privacy Forum (FPF) convened a series of six panels, each addressing the intersection of immersive technology and a critical sector or segment of the population. The series focused on the privacy and regulatory implications of immersive technologies in the domains of health and wellness, advertising, vehicles, education, AI, and kids and teens.

This issue brief summarizes major insights from each panel in FPF's event series and provides high-level takeaways and throughlines from the overall series. The series' major themes are:

- **Need for improved measurements:** Organizations need better methods for measuring the effectiveness of immersive technologies in achieving specific objectives such as improved health or learning outcomes, particularly as compared with traditional technologies, systems, or processes.
- **Maintaining compliance as technology evolves:** Immersive technologies with new interfaces and complex data transfer arrangements may challenge organizations' existing privacy and data protection compliance approaches.
- **Design challenges:** Organizations may have difficulty designing disclosure, consent, and safety features in ways that fit naturally in immersive technologies while remaining effective.

The insights from the panel series will help practitioners, policymakers, and others proactively identify major privacy pain points for immersive technologies, their regulatory challenges and opportunities, and remaining areas of uncertainty.

INTRODUCTION

Immersive technologies—an umbrella term that covers extended reality (XR), virtual worlds, neurotechnologies, and other similar technologies—are changing the way people live, including how they work, play, learn, and take care of their health. While immersive technologies present new opportunities to improve a wide variety of industries and sectors, their reliance on large amounts of personal data raises privacy risks as well. As regulators around the globe continue to implement privacy laws, it's not always clear how, or if, these laws would impact immersive technologies differently than other types of technology. There are also questions about the unique risks that arise when immersive technologies are integrated into domains like health, advertising, and education. As immersive technologies become more ingrained in the technology landscape, it is critical to understand their capabilities and unique risks. In addition, more work must be done to determine the best practices organizations can adopt to protect people's privacy, as well as when additional regulations may be needed to address particular risks.

Through a series of panels, FPF sought to address these emerging questions by asking: *what is unique or new about immersive technologies?* The series highlighted the many ways in which immersive technologies intersect with other key aspects of technology and privacy, namely in health and wellness, advertising, vehicles and the automotive industry, education, AI, and youth privacy. Each panel explored these technologies' potential benefits as well as how, without proper safeguards, they could threaten privacy by, for example, enabling inferences of sensitive personal information.

Key themes that emerged from the series include:

- **Need for improved measurements:** Organizations need better methods for measuring the effectiveness of immersive technologies in achieving specific objectives such as improved health or learning outcomes, particularly as compared with traditional technologies, systems, or processes.
- **Maintaining compliance as technology evolves:** Immersive technologies with new interfaces and complex data transfer arrangements may challenge organizations' existing privacy and data protection compliance approaches.
- **Design challenges:** Organizations may have difficulty designing disclosure, consent, and safety features in ways that fit naturally in immersive technologies while remaining effective.

THEMATIC TAKEAWAYS & QUESTIONS

In 2023, FPF hosted six panels covering some of the unique issues related to the use of immersive technologies in a number of sectors or with regard to specific communities. The below summarizes major takeaways and remaining questions from each panel.

A. HEALTH & WELLNESS

Main Takeaways:

- **XR's benefits and risks in health:** XR technologies can help individuals learn more about their own health, provide doctors with new diagnostic tools, and increase access to healthcare. At the same time, they can also cause privacy harms when they capture or enable inferences based on personal information about an individual's health, such as health conditions or cognitive decline, whether or not those inferences are accurate.
- **Lack of user clarity:** People often have a poor understanding of the breadth and depth of health inferences that can be made from data in XR environments, let alone how organizations could use this information in impactful ways (e.g., an insurance company using health data from XR to deny a claim or isolate a pre-existing condition).
- **Regulatory challenges:** Recent regulatory and legislative activity, including the FTC's recent *GoodRx* enforcement action and the passage of Washington's My Health My Data Act, have significant implications for XR technologies. Businesses that use or develop these technologies must think about how they can mitigate privacy harms by investing in privacy-enhancing technologies such as encryption and on-device processing.

Remaining Questions:

- Will Washington state's My Health My Data Act, and other similar consumer health laws, be interpreted to cover much of the body-related and behavior data used by immersive technologies like XR?
- How should medical ethics be incorporated into consumer health companies' research and development? For example, if particular personal data gathered in XR could reveal the existence of a health condition, should anyone be proactively alerted, such as the individual user, a guardian, or a medical professional?
- How can users be helped to better understand the web of different actors in the immersive tech and healthcare ecosystems, who is sharing data with whom, and which entities are covered by different health privacy laws?

B. ADVERTISING

Main Takeaways:

- **Uncertainty about measurements and conversions:** While data captured from users in XR environments could theoretically be used to improve advertising measurement and conversions, it remains uncertain whether XR advertisements will be more effective than their web and mobile counterparts.
- **Compliance challenges:** Organizations may find it challenging to apply existing compliance approaches to advertising in virtual worlds, including those regarding notice and consent, due to the three-dimensional nature of these environments and the number of actors involved.
- **Designing appropriate notice and consent mechanisms:** Designers will need to figure out how to provide users with the appropriate information they need regarding data practices, while not disrupting their experiences or overwhelming them with messages.

Remaining Questions:

- How can platforms prevent targeted immersive advertising from leading to discrimination or biased treatment, particularly when AI is used in targeting? How can they prevent the surreptitious collection or use of sensitive data?
- Will branded experiences in immersive spaces differ from other forms of advertising in terms of privacy? If so, how?
- How should platform operators govern influencers and endorsers on their platform, including if individuals must self-label as endorsers when promoting a particular product?

C. VEHICLES

Main Takeaways:

- **Privacy policies and practices are not standardized:** Companies can create XR experiences that allow them to observe how individuals behave in virtual environments, including heat maps that reflect where a user’s attention is concentrated. Some companies have privacy policies in place and require the end user’s consent before collecting and using this information, but others do not.
- **Design is key:** When people experience new information or displays in a place they are not used to, it can be distracting. To remain safe, XR applications in vehicles must be careful about where content is placed, and be intentional about features such as display size, color, and font.
- **Technical limitations:** A challenge for high-quality in-vehicle XR applications is the “spatial checking problem,” in which the application must know both the headset’s location in relation to the car as well as the car’s location relative to the world.

Remaining Questions:

- Can manufacturers design notice and consent flows within vehicles in a way that takes into account the different privacy expectations of multiple passengers?
- How can manufacturers design immersive safety features so that they don’t distract drivers?
- Given that most immersive features in vehicles are still in development, how should developers properly account for privacy regulations that will likely emerge and evolve over the next few years, including specifically for the automotive industry?

Watch the Immersive Tech Panel Series: Vehicles Session on the [FPF YouTube Channel](#).¹

¹Immersive Tech Panel Series: Vehicles (September 18, 2023): <https://www.youtube.com/watch?v=N527A0bQBDU&t=198s>

D. EDUCATION

Main Takeaways:

- **Intentional program design:** Immersive education offerings should be developed with intentionality and purpose. Offering both digital and analog learning is expensive, and schools need to figure out the right balance based on their students' needs. This involves including students and educators in the design process.
- **Student privacy considerations:** U.S. federal and state student privacy laws, like the Family Educational Rights and Privacy Act (FERPA), have been interpreted to apply to new areas like immersive technologies, though data collection in these environments poses unique student privacy concerns. Students and educators may also not trust the technology or the organization behind it to handle their data safely.
- **Principles for developing an immersive learning curriculum:**
 - Do no harm: conduct privacy and cyber risk analysis and respond appropriately.
 - Do some good: ensure the technology is implemented in a way that is actually useful.
 - Good curriculum design: solicit student and educator feedback early and regularly.

Remaining Questions:

- How can educational institutions adopt immersive technologies in a way that minimizes the risk of bias, discrimination, harassment, and abuse?
- What are the biggest pedagogical benefits to adopting immersive technology in an educational context?
- What further actions—from school districts, policymakers, and industry—are needed to bridge the digital divide and ensure all students have equitable access to educational immersive technologies?

Watch the Immersive Tech Panel Series: Education Session on the [FPF YouTube Channel](#).²

²Immersive Tech Panel Series: Education (October 19, 2023): <https://www.youtube.com/watch?v=GZpJaDseyN4>

E. ARTIFICIAL INTELLIGENCE

Main Takeaways:

- **Intersection of AI and immersive technologies:** AI and immersive technologies go hand in hand—AI is crucial to building the “metaverse,” and the “metaverse” is critical to accelerating AI. Content generation with generative AI models is just one way in which AI is integrated into immersive technologies; it is also used for things like computer vision, virtual assistants, and security features (e.g., AI scanning downloads to identify malware).
- **The threat of deepfakes:** Integrating AI into immersive technologies, which are often more realistic and compelling than non-immersive technologies, could exacerbate manipulation and disinformation. For example, deepfakes or other generated content could be used to mislead, exploit, or harass, and these risks are heightened for youth and marginalized communities. Watermarking AI-generated content and educating the public about these risks could address part of the problem.
- **Maximizing benefits while minimizing risks:** Organizations can protect user privacy in part by allowing user controls, such as opt-in and opt-out mechanisms; training AI with only the data that is needed and minimizing other user data collection; and cultivating user trust to ensure they understand what, why, and how data is being used.

Remaining Questions:

- How can companies be transparent with users about their use of AI to generate content in an immersive environment without degrading the experience, or making it less immersive?
- How might manipulative design or so-called “dark patterns,” particularly related to AI, manifest in immersive spaces? What technical mitigations can be implemented to prevent AI-driven manipulative practices?
- Do the principles and standards developed over the last few decades in relation to user-generated content in social media and digital platforms apply to immersive environments as well? Or do we need new ones, particularly with the introduction of AI-generated content?

Watch the Immersive Tech Panel Series: AI Session on the [FPF YouTube Channel](#).³

³ Immersive Tech Panel Series: AI (November 9, 2023): https://www.youtube.com/watch?v=KSrd_-OFVlo

F. KIDS & TEENS

Main Takeaways:

- **Three kinds of risk involved in kids and teens using immersive technologies:**
 1. Legal compliance (COPPA, state children’s privacy laws)
 2. Actual harm (individual, organizational, societal)
 3. Perception and trust issues
- **Creating safe, inclusive spaces:** When developing guidelines for youth and immersive technologies, policymakers and others need to be aware of how age and developmental stages impact the safety of the technology. Companies should also design products and services to promote inclusivity, being accessible to and reflective of the whole population of users.
- **Ensuring compliance despite changing technologies:** Today’s Children’s Online Privacy Protection Act (COPPA) may be closer to a floor than a ceiling. The law has responded to new technologies (e.g., the 2013 COPPA rule covering mobile devices and social networks), with more rulemaking to come. Companies should assess products early and regularly to ensure COPPA compliance, which can serve as a starting point when building products.

Remaining Questions:

- How will the FTC’s enforcement of COPPA evolve as immersive technologies rapidly advance? Will additional COPPA rulemaking track these technologies’ development?
- How can parents and guardians be educated and empowered to have healthy conversations with their kids and teens about privacy and safety in immersive environments?
- With a lack of laws regarding teen data, how should companies best design immersive experiences for teens and address the tension between granting parental control and respecting teens’ privacy?

Watch the Immersive Tech Panel Series: Kids & Teens Session on the [FPF YouTube Channel](#).⁴

⁴Immersive Tech Panel Series: Kids & Teens (December 6, 2023): <https://www.youtube.com/watch?v=OrQYqPAZkc>

CONCLUSION

As companies build and adopt more immersive technologies, it becomes increasingly important they do so in a way that values privacy and safety, adapting best practices to the new risks these technologies raise. With regulators around the globe implementing privacy laws, it is also critical that regulations are well-suited for immersive technologies' new and unique interfaces, data modalities, and data transfer arrangements. The insights from this panel series provide a foundation for practitioners, policymakers, and others to identify immersive technologies' relevant privacy issues, as well as their regulatory challenges and opportunities. Future efforts should build on these takeaways to address issues of design, compliance, best practices, and other remaining questions.



1350 Eye Street NW Suite 350
Washington, DC 20005

info@fpf.org

FPF.org