

for virtual worlds. This also includes looking at what (legal) instruments and other tools are already in place without overregulating something which is still developing.

Finland considers it important that the goals set in the Digital Decade Policy Programme are implemented into their fullest and that the integral role of generally applicable core technologies, such as 5G/6G, advanced chips, super and quantum computing, cloud and edge computing technologies and general purpose AI, are recognised in the realisation of virtual worlds. In this regard, the EU should develop a **shared vision to promote international standardisation.**

Virtual worlds create new kinds of needs and demands with regard to our **data infrastructure.** Interoperability of platforms has the potential of enabling cross-sectoral innovations and economically scalable solutions. In addition to technological capacities, specific effort should be put in realising infrastructure for common European data spaces, especially for mobility, built environment and IoT, as this would facilitate the creation of digital twins. Alongside the hard and soft infrastructures, we must scale up **people's competencies and skills to create virtual and immersive content,** especially for industrial applications, to support projects already on the way.⁹

Finland also seeks to put strong focus on ensuring that virtual worlds and various technologies are **developed on a basis of international multilateral cooperation and towards interoperability and open standards** such as the current internet protocols and open internet. In order to ensure a fair operating environment, competition and innovation, we must make sure that the development and solutions are accessible for all, regardless of their physical abilities, socio-economic background or technical skills. Hence, the collaboration is needed between companies, developers, and users in the design, development, and governance of virtual worlds.

No single actor should be in a dominant position to set the rules in virtual environments. The metaverse and Web 3.0 will be most impactful if different platforms and systems can interact seamlessly. Research in open protocols, APIs, and data standards will foster collaboration and ensure a more inclusive ecosystem.

The EU should facilitate innovation to support early application and development also through enabling regulative environment. This should be reflected horizontally in the better regulation initiative. We also must make sure that the "Big 5"¹⁰ – globally oriented EU regulations which are either coming into force or under negotiation – are implemented uniformly and, if needed, strengthened to support interoperability and level playing field for virtual worlds, metaverses and decentralised Web 3.0 platforms.

Questions left to be answered

Virtual worlds and immersive technologies can have both positive and negative effects on the society and users. In addition to new opportunities, virtual worlds may create new risks. To tackle them, we must ensure data protection, cybersecurity and data security and also recognise new forms of vulnerabilities and criminal acts. Research on the psychological impact of virtual worlds, as well as tools to promote mental well-being is needed. This comes with the question of how we should address responsibilities and accountability in established virtual organisations (such as decentralised autonomous organisations or DAOs) that can have millions of co-owners. How the new forms of employment and entrepreneurship could be supported in the metaverses? How it could be enabled

⁹ A Human-Driven Industrial Metaverse: [https://www.vttresearch.com/sites/default/files/2022-11/Human-Driven%20Industrial%20Metaverse%20A4%20\(1\).pdf](https://www.vttresearch.com/sites/default/files/2022-11/Human-Driven%20Industrial%20Metaverse%20A4%20(1).pdf)

¹⁰ The EU's new data regulations will bring benefits to companies and society – four recommendations for seizing the opportunities <https://www.sitra.fi/en/news/the-eus-new-data-regulations-will-bring-benefits-to-companies-and-society-four-recommendations-for-seizing-the-opportunities/>

metaverses as learning environments? Will individuals be able to benefit from the value they co-create within virtual spaces? And which public services could be brought to the metaverses?

This calls for legal stability of virtual assets and means to protect the value and ownership of tokenised assets and commodities. Finally, how will we create an enabling and risk-based framework for virtual worlds that encourages recreational, commercial, industrial and public applications?

Other supporting material

- 6+1 recommendations for Finland - How can regulation improve the conditions for Web 3.0 business? <https://www.sitra.fi/en/publications/61-recommendations-for-finland/>
- Study by the Technical Research Centre of Finland (VTT), Can industrial metaverse solve the labour shortage challenge? <https://www.vttresearch.com/en/news-and-ideas/can-industrial-metaverse-solve-labour-shortage-challenge>
- Virtual Reality Finland ry association, current initiatives: <https://www.vrfinland.fi/initiatives-1>
- 3D modelling and virtual worlds, National Land Survey of Finland (Maanmittauslaitos): <https://www.maanmittauslaitos.fi/en/research/3d-modelling-and-virtual-worlds>
- Examples of other uses cases: <https://finnishmetagallery.fi/en/#about>
- HomeOpera project: <https://esignals.fi/en/category-en/service/the-worlds-best-metaverse-comes-from-finland/#d7b02f24>

Maria Rautavirta
 Director of Data Business Unit
 Data, Safety and Security Department