



XTIC
EXPERIENTIAL TECHNOLOGY INNOVATION CENTRE

A perspective on **Finland's Metaverse Strategy**



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Foreword



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This document, A Perspective on Finland's Metaverse Strategy, reflects India's proactive and forward-looking approach to digital transformation. Developed by the Metaverse India Policy and Standards (MIPS) Committee under the eXperiential Technologies Innovation Center (XTIC) at IIT Madras, it draws on the expertise of leading Indian scholars, industry experts, and startup innovators. Beyond academic analysis, this work serves as a practical reference for policymakers, businesses, and researchers seeking to understand and benchmark global Metaverse strategies in the context of shaping India's own policy framework. It highlights Finland's pioneering Metaverse strategy—the first of its kind in Europe—guided by our core values of well-being, freedom, openness, and inclusivity, and built on a foundation of trust. The report illustrates how such value-driven approaches can shape technology policies that benefit society while effectively managing risks related to privacy, security, and sustainability.

Finland's strengths in extended reality (XR), gaming, and design, combined with its commitment to democratic principles, offer valuable insights for

India's policy development. The MIPS Committee also emphasizes the importance of establishing clear, measurable policy benchmarks and ensuring greater inclusion of perspectives from the Global South.

Combining the strengths of Finland's Metaverse policy with India's pioneering digital transformation initiatives—such as Digital India and IndiaAI—charts a progressive and strategic path forward. These initiatives have been instrumental in building a secure, scalable, and inclusive digital ecosystem that empowers citizens and drives economic growth. India's foundational digital public infrastructure—including Aadhaar for digital identity, UPI for instant payments, and India Stack for interoperable services—provides a robust platform for the development of the Metaverse. Complementing this foundation, IndiaAI spearheads advanced research and deployment of artificial intelligence tailored to India's diverse socio-economic landscape, fostering innovation across governance, healthcare, education, and industry. Through the MIPS initiative, India is actively contributing to global standardization efforts in the

Metaverse. By drawing insights from Finland's policy models, India is better positioned to craft frameworks that promote an open, fair, inclusive, and sustainable digital future.

As countries worldwide increasingly adopt human-centric approaches to digital innovation, India and Finland have emerged as forward-thinking leaders in advancing innovations like the Metaverse. This bilateral collaboration draws on Finland's globally recognized innovation ecosystem and India's rapidly expanding technology sector to promote inclusive, sustainable, and human-centered digital transformation. In a rapidly evolving technological landscape—where devices, platforms, data capabilities, and applications transform at unprecedented speed—policy frameworks must be agile, forward-looking, and rooted in continuous learning, strategic foresight, and international collaboration. Through joint research, innovation, and capacity-building efforts, India and Finland aim to position themselves as global leaders in the development and governance of the Metaverse, shaping a future that is ethical, resilient, and centered on human values.



Executive Summary

Finland's Metaverse Strategy is bold and inspiring. It aims to be a global leader in the Metaverse industry by 2035, focusing on wellbeing, freedom, openness, and trust. It shows strong values and a clear vision. It connects technology to social good, which makes it different from many other strategies. Finland has clear strengths in XR, education, governance, and sustainability. It also has big opportunities in industrial applications, healthcare, and global cooperation.

Although the strategy is very strong as it is value-driven and connects technology development to social goals of the local population, scalability to global goals may be required. More measurable benchmarks are critical for tracking progress and hold stakeholders accountable: for example, 1) Ethical Metaverse Index that includes interoperability, content moderation and privacy, 2) Responsible Metaverse Index that includes global connectivity, particularly to the global south, innovation and creativity, diversion and inclusivity, and sustainability, and 3) Transparent

Metaverse Index that includes trustability and platform governance.

Finland is exceptionally well-positioned to shape the global Metaverse industry, largely because it is taking proactive steps and entering the arena early. By starting early, Finland can play a key role in developing international standards and advocating for open systems, which will help ensure fairness and interoperability in future digital environments. The country's politically neutral stance provides it with credibility in global discussions, allowing Finland to act as a trusted and unbiased facilitator in shaping the future of the Metaverse.

Finland's established expertise in extended reality (XR), gaming, and design also presents unique opportunities. The nation's successful gaming and cultural sectors are capable of generating rich, immersive digital content for Metaverse platforms, thereby boosting cultural exports and global influence. Leveraging its strengths in these areas, Finland is set to build an ecosystem that connects research organizations, startups, and industry

for maximum innovation and impact. This strategy helps ensure that Finland will be seen worldwide as a leader not only in technology, but also in responsible and creative Metaverse development.

Leadership that truly has global impact must be inclusive, especially of societies from the Global South, given the realities of a new multipolar world order. Finland's ability to translate its vision into meaningful action depends on this broad approach. If such inclusivity is prioritized, Finland could set an inspiring example for fairness, openness, and sustainability in the emerging Metaverse ecosystem.

However, the success of such ambitions ultimately rests on securing sufficient financial resources. Implementing nationwide programs, developing infrastructure, advancing research, and supporting innovators all require significant investment. Without a concrete funding framework, through government support or private sector backing, the strategy risks remaining aspirational rather than transformational.



Introduction



The eXperiential Technologies Innovation Center (XTIC) is established by IIT Madras, one of India's premier institutes. XTIC has recently constituted a committee to draft India's Metaverse Policy: the Metaverse India Policy and Standards (MIPS) Committee. This initiative brings together international standards agencies and various stakeholders to foster a global Metaverse that is pervasive, open, and inclusive.

The MIPS forum does not directly produce standards or policies. Instead, it coordinates resources and identifies needs to support the development of standards and policies within relevant organizations. This collaborative approach of all the stakeholders ensures that the evolving Metaverse ecosystem benefits from comprehensive and well-aligned guidelines.

MIPS has recently been very active in contributing to new standards in ITU



as part of few study groups in the field of Metaverse.

MIPS committee was tasked to analyse Metaverse policy of various other countries before formulating our own. In this process, MIPS is creating our perspective on Finland's Metaverse policy to understand its vision and approach in depth. This will help us gain insights that can guide the drafting of a well-grounded Metaverse policy for India. We have several of our members from the MIPS committee that have contributed in creating this perspective. **Appendix C has a list of all contributors.**

The committee referred the definition and analysis of Metaverse from the ITU standards committee [1].

The committee analysed the policy of Finland published by Business Finland [2].

Finland is at the forefront of immersive technology and was the first European country with a national Metaverse Initiative, shaping future digital experiences. Finland has created an excellent Metaverse Strategy with a clear vision to make Finland a global leader in the Metaverse by 2035. The plan is built on Finnish values of well-being, freedom, openness, trust and at the same time mitigate the harmful effects of the Metaverse on the country's health, privacy, security, and environment. It includes five main programs: Technology Enablers, Business Networks, Metaverse Society, Metaverse Health, and Industrial Metaverse. The strategy is bold at the same time encouraging for creating new businesses, jobs, innovations, and exports.

Summary or Highlights of Finland's Metaverse Policy (ref[2])

1. Finland aims to be a global leader in the Metaverse industry by 2035, focusing on wellbeing, freedom, openness, and trust.
2. The strategy is driven by Business Finland and the Finnish ecosystem to harness virtual potential for real-world impact and economic growth.
3. The Metaverse is recognized as a convergence of physical and digital worlds, expected to reach a value of \$8-13 trillion by 2030.
4. The initiative seeks to mitigate risks, such as security, health, and privacy concerns, while promoting new business, jobs, and innovations.
5. Five primary programs structure the strategy: Technology Enablers, Business Networks, Metaverse Society, Metaverse Health, and Industrial Metaverse.
6. Finland's approach emphasizes open standards, technological autonomy, and broad international cooperation, aligning with European efforts.
7. Education and training for Metaverse skills are prioritized, with immersive learning experiences and early exposure in schools.
8. Health programs will leverage XR technologies for improved outcomes, access, and brain capital development.
9. The strategy encourages active research, industry collaboration, hackathons, global marketing, and fostering new talent through incentives.
10. Recommended actions include infrastructure development, regulatory participation, startup incubation, public awareness campaigns, and sector-specific pilot projects.



Why did we study the strategy in detail and create our perspective?

This commentary is not an academic exercise but considered a very practical tool. It helps us in India as policymakers, businesses, and researchers understand global approaches to the Metaverse, compare strategies, and develop stronger and more context-appropriate policies in their own settings.

What we in India learn from the strategy:

- We learn, adapt, and improve policy and strategy design in our own contexts.

- It helps us identify best practices (what works well). Finland's policy gives us an excellent indication of how to integrate social values into a tech policy.
- As policies are not "one size fits all", we in India can ask ourselves "what can we adapt to our context". India might learn from Finland's collaborative ecosystem approach and adapt funding models to local realities.
- To provide insights for future international cooperation, especially within the European Union and other global forums.



- It helps us identifying Gaps and Risks for our own policy

Below is a detailed perspective that looks at its strengths, challenges, opportunities, and threats.

Strengths

The strategy is strong because it is clear and value-driven. Finland connects technology development to social goals. The plan is not just about business. It also wants to improve well-being, democracy, and education. This makes the strategy broader and more human-centered.

Finland has a strong base of technology companies such as Nokia, Rovio Entertainment and universities like University of Oulu, Aalto University, University of Helsinki. Over 200 XR companies are already active. Please refer to Appendix A for a listing of some of these companies.

Finland also has leading research in areas such as sensors, optics, human-machine interaction, and AI. Companies such as Nokia give Finland credibility in telecom and global markets. Please refer to Appendix B for a listing. This helps the country to push forward with the Metaverse.

The strategy includes structured five different programs.

- 1) Technology Enablers will focus on infrastructure.
- 2) Business Networks will build ecosystems with local and global partners.
- 3) Metaverse Society will introduce citizens to the Metaverse.
- 4) Metaverse Health will focus on using VR and AR to improve health and mental well-being. And
- 5) The Industrial Metaverse will target sectors like manufacturing, logistics, and construction. These five programs give a clear framework.

It proposes a measurable quantitative index to monitor the Metaverse Capacity: "Metaverse maturity index", which measures the Metaverse capability of each country sets up a platform for global collaborative efforts. They intend to start publishing an annual "Metaverse maturity index".

A major strength is Finland's social model. It is grounded in universal social welfare, equality, and high

public trust, offering generous access to education, healthcare, and social protection for all citizens. This inclusive and egalitarian approach is widely credited as a core reason Finland has been ranked the world's happiest country for eight consecutive years, according to the World Happiness Report. The country's strong emphasis on work-life balance, excellent social support systems, access to nature, and effective public services all underpin the well-being and life satisfaction of its population. This highly successful social model is the main reason for the country to have high levels of trust in government and institutions. It has strong democratic traditions, equality, and openness. This makes it easier to create inclusive programs. Finland is also known for sustainability, which adds credibility when promoting a responsible Metaverse. These unique characteristics make the policy stand apart from any other country's policies that we have come across.





Challenges

Although the strategy is very strong as it is value-driven and connects technology development to social goals of local population, scalability to global goals may be required. Without the global social goals and involvement of global society, it may be challenging to move from vision to action.

The goal of being the global leader in the Metaverse by 2035 may be quite challenging. Large global players like Meta, Apple, and Google have more resources. Competing with them on a global scale is very difficult without being inclusive of global society, particularly of the global south.

The strategy might require more financial details. A strong funding plan is required, otherwise the programs may struggle to move from vision to action. It may be challenging to consolidate funding for inclusion, the benefit of global society, particularly for the global south.

Measurable goals / metrics will have to be defined, else it will be hard to track progress and hold stakeholders accountable. Although Metaverse

capacity index is defined, defining other indices may be necessary as well.

The Whitepaper that XTIC published last year [3] refers to three different Metaverse Indices:

- 1) Ethical Metaverse Index that includes interoperability, content moderation and privacy,
- 2) Responsible Metaverse Index that includes global connectivity, particularly to the global south, innovation and creativity, diversion and inclusivity, and sustainability,
- 3) Transparent Metaverse Index that includes trustability and platform governance.

Without clear, quantifiable objectives, it becomes difficult to assess progress, make informed decisions, and ensure that all the stakeholders are aligned with the overall vision. Concrete metrics allow leaders to make data-driven decisions throughout the plan. If progress lags, resources can be



reallocated or strategies adjusted based on objective evidence.

The strategy mentions issues like privacy, security, and addiction, but there is a need for a detailed plan for how to solve them. Citizens may lose trust if risks are not managed.

As in any other country public adoption could be slow. While Finland has a strong technology sector, many citizens may not understand or accept the Metaverse easily. The strategy depends on awareness campaigns and education, but this will take time and effort.

Opportunities

opportunity

Finland has good chances to shape the global Metaverse space. Because it is starting early, it can influence international standards and promote open systems. Finland's neutral political stance gives it credibility as a fair player in global discussions.

The country has strengths in XR, gaming, and design. These can be turned into global exports. For example, gaming and cultural industries can create content for the Metaverse. Industrial applications like digital twins and teleoperation can also create exportable solutions.

Finland is a recognized global leader in the gaming industry, thanks to a combination of innovation, education, supportive policy, and globally successful companies. It stands out as a global leader in the gaming industry and is increasingly recognized for its pioneering role in the early development of the Metaverse policy, blending virtual worlds, advanced gaming technology, and community experiences.

How Finland Leads in Gaming

- **Pioneering Companies:** Home to world-famous studios like Supercell (Clash of Clans, Hay Day), Rovio (Angry Birds), Remedy Entertainment (Max Payne, Alan Wake), and Colossal Order (Cities: Skylines), making a significant impact worldwide.
- **Mobile Gaming Dominance:** Finnish companies set benchmarks for mobile gaming, with Supercell named the most profitable mobile game company globally in 2015, and Rovio's Angry Birds hitting international fame rapidly after launch.
- **Innovative Ecosystem:** A thriving ecosystem of over 200 studios continues to drive innovation, supports startups and established developers alike, backed by strong government and institutional investments, advanced research, and world-class education focused on digital arts and technology.
- **Per Capita Leadership:** Finland has the largest gaming industry in Europe per capita, contributing significantly to national export revenues and attracting talent from all over the world.
- **Cutting-edge Tech:** Finnish studios are leaders in adopting and pioneering technologies like AR, VR, XR, and even national Metaverse initiatives, supported by robust research infrastructure.



- **Education and Talent:** Over 20 educational institutions offer game development programs, fueling a highly skilled workforce.
- **Inclusive Industry:** A large proportion of game industry professionals in Finland are foreign-born, contributing diverse perspectives for creative output. Major industry events, such as the Leadership Day by IGDA Finland and Finnish Games Week, showcase the nation's commitment to excellence, diversity, and international collaboration in gaming and immersive experiences.
- **Supportive Community:** Organizations like Neogames and Game Makers of Finland advocate for developer wellness, legal rights, and industry growth.

Supported by world-class digital literacy, education, and government-backed R&D, Finland's gaming sector not only generates billions in exports but also fuels cutting-edge work in the Metaverse and new digital frontiers, positioning Finnish talent and studios at the forefront of global gaming and Metaverse leadership.



Varjo is a Finnish company, a global leader in VR hardware, that makes ultra-realistic virtual and mixed-reality headsets used for advanced training, design, and Metaverse experiences. They are well known for their professional XR/VR hardware with very high fidelity displays and optics.

Revenue and Employment: The Finnish games industry's annual revenue exceeds €2 billion and employs thousands, making it one of the country's top cultural export sectors.

Education and research are other opportunities. Finland has a strong education system and world-class universities. By training experts in XR, AI, and digital design, Finland can attract foreign investments and talent.

The Metaverse Health program offers unique potential. If Finland becomes a leader in VR-based healthcare, it can export both products and models. This will also support Finland's national goals of well-being and brain capital development.

Partnerships with the EU and other countries are also possible. The EU's Web 4.0 strategy aligns with Finland's values. By working together, Finland can access funding, influence regulations, and ensure that European countries do not fall behind global tech giants.

Vulnerabilities



Global competition is a big challenge. Technology giants in the US and China dominate hardware, platforms, and ecosystems. Finland risks being overshadowed by them. If global standards are set by others, Finland's voice has to be strong enough.

Technology moves very fast. New devices, networks, or platforms could make today's plans outdated. Finland should keep up to retain its early advantage.

Geopolitics is vulnerable. Finland is now a member of NATO, and global



tensions are rising. Technology strategies are often linked with power politics. This could make global cooperation harder.

Privacy and data security are also risks. If citizens do not trust the systems, adoption will fail. Addiction and overuse of virtual environments are other concerns. These could harm well-being instead of supporting it.

Finally, there is economic concern. Without a clear funding plan, the strategy may not be feasible. Building infrastructure, supporting research, and funding businesses are all expensive. If the government or private sector cannot provide enough resources, the vision may remain only on paper.

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Appendix A

Well-known XR / AR / VR / mixed-reality companies in Finland

1. Varjo	25. MatchXR (ecosystem companies)	49. Up Studios
2. Arilyn	26. Sova3D	50. Dispel
3. ZOAN	27. Reality Crisis	51. Twinity / Twin modelling firms
4. Stereoscape	28. Quarantine Studios	52. Zerynth
5. Dispelix	29. Mixx Reality	53. Iriun
6. OptoFidelity	30. Spinverse	54. Lyra Labs
7. Revieve	31. VTT spinouts & labs	55. Koko
8. Glue Collaboration (Glue)	32. Upknowledge	56. Vela
9. CTRL Reality (CtrlReality)	33. Valmet	57. StoryWorks Studio
10. 3D Talo	34. Neogames Finland	58. Patteri
11. Pop In Games	35. Dispelix	59. InnoXR
12. MeKiwi / VRKiwi	36. Revieve	60. Arcturus
13. VRTrauma (VRTrauma Oy)	37. PopIn / Pop In Games	61. Twinmotion partners
14. Twinverse (Twinverse Oy)	38. Visible Realms	62. SeeTrue Technologies
15. Wakeone	39. Vizor	63. Spatial8
16. VividWorks	40. Poppin (small XR studios)	64. ZERØ
17. Fake Productions / Fake	41. SoundXvision	65. Upstream studios
18. Pikkukala	42. SenseTrix	66. Stereoscape spinouts
19. Sayduck	43. Stellarion	67. 3DVista providers
20. Osgenic	44. Meemoo	68. MatchXR event companies
21. Grib (Grib3D)	45. Intopalo Digital	69. Helsinki XR Center groups
22. 3DBear	46. Sanni Pöntänen Studio	70. Nordic XR Startups portfolio companies
23. Lyfta	47. Cineshare	71. Finnish Game Studios (XR-active)
24. Revontuli	48. Valued Labs	

Appendix B

Leading Finland-Based Research Companies in Sensors, Optics, HMI, and AI

Name	Focus Area(s)	Notes
VTT Technical Research Centre of Finland	Sensors, Optics, HMI, AI	Finland's national applied research center; develops advanced prototypes and works with industry.
Nokia	Connectivity, Sensing, HMI, AI	Strong R&D in 5G/6G, network sensing, human-machine interaction, and edge AI.
Varjo	Optics, HMI	Makes high-fidelity VR/XR headsets; leaders in immersive display optics.
Dispelix	Optics	Designs AR waveguide optics; world leader in lightweight diffractive optics.
OptoFidelity	Sensors, Optics	Provides testing, measurement, and calibration systems for optical devices and sensors.
Vaisala	Sensors	Global leader in industrial and environmental sensors (weather, climate, air quality).
Bittium	Sensors, AI, Medical HMI	Develops secure communications, wearable biosensors, and medical monitoring devices.
Silo AI	AI, HMI	Europe's largest private AI lab, focused on applied AI in multiple industries.
Reaktor	AI, HMI	Builds applied AI and software systems; works in UX and human-machine interaction.
Valmet	Sensors, Industrial AI	Develops automation, sensors, and digital twins for industrial processes.
Aalto University (research groups & spinouts)	Optics, HMI, AI	Strong academic research; spinouts in XR, design, and interaction technologies.
University of Helsinki (research groups & spinouts)	AI, Sensors	World-class machine learning and computer science research; collaborates with companies.
Helsinki XR Center	HMI, XR	Joint industry-academic hub for XR and immersive interaction research.
SeeTrue Technologies	Sensors, Spatial Computing	Develops eye-tracking and spatial sensing solutions for XR devices.
Spatial8	HMI, AI	Small research-driven firm working on spatial computing and interaction.
ICEYE	Sensors (SAR satellites)	Builds and operates satellites with advanced radar sensing; leader in spaceborne sensor technology.



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