

**BUSINESS
FINLAND**

REPORT Fall/2024

QUARTERLY FORESIGHT

News

Signals of Change

The Metaverse of Consumers

Emerging Climate Tech



ABOUT THE SIGNALS

WHY SIGNALS OF CHANGE PUBLICATION?

Signals

Signals are early indicators of potentially significant future developments. Signals are often subtle and may initially appear as random or insignificant, but they can provide valuable insights into emerging trends and disruptions. By identifying and analyzing weak signals, organizations can anticipate changes and adapt their strategies accordingly.

Why does Business Finland collect signals?

For Business Finland's customers, weak signals can play a vital role in planning ahead. They help companies to:

Identify Emerging Opportunities and Risks:

Weak signals can highlight new market opportunities or potential threats that may not yet be apparent through traditional trend analysis. This allows companies to proactively address these changes and stay ahead of the competition.

Enhance Strategic Foresight:

Incorporating weak signals into strategic planning helps ensure that strategies are agile and future-proof. By regularly scanning for weak signals, companies can validate and adjust their strategic foresight plans to remain relevant and effective.

Improve Decision-Making:

Weak signals provide additional context and insights that can inform better decision-making. By understanding the potential implications of these signals, companies can make more informed choices about their future direction.

Foster Innovation:

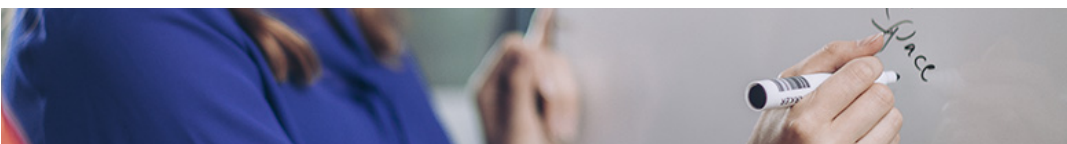
Weak signals often point to nascent trends or technologies that could drive innovation. By recognizing these early indicators, companies can invest in research and development to capitalize on new opportunities and drive growth.

Business Finland, together with Team Finland, detects weak signals across the global network of experts. Weak signals are an essential component of horizon scanning, enabling Business Finland's customers to anticipate and navigate future changes, seize new opportunities, and mitigate risks effectively.

In this quarterly publication, we want to share recent picks and tell about recent projects with customers.

Quarterly Foresight is a Business Finland Publication. Business Finland's foresight team has curated the insights to provide information on future opportunities and challenges.

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WHAT'S NEW IN FORESIGHT FALL '24



FORESIGHT NEWS

How to make strategic foresight your company's superpower? How to make sense of radical new technologies and moonshot ideas in business? Is there link between impactful foresight and firm performance? These are some of the questions responded in a recent Guidebook for organizing Corporate foresight by VTT.

The importance of strategic foresight and benefits of its application in business has been acknowledged in a pile of foresight literature over the years. At best, strategic foresight helps companies prepare for future changes and identify new business opportunities. Still many companies, particularly in SME sector, struggle to find relevance and opportunities of foresight in their day-to-day operations. From this perspective VTT, together with a group of companies and Tampere University, conducted a research project Strategic foresight for companies (2022-2024).

Guidebook for organizing corporate foresight: [PDF](#) (vtt.fi)

In addition to Guidebook, the project launched a Corporate Foresight Network, a collaboration network among companies in the field of strategic foresight. The network aims to share knowledge and best practices and promote cooperation between companies.

SIGNALS OF CHANGE

Liberal Arts for Scientific Progress



PREMISE

Liberal arts might become increasingly important for the future of science.

DESCRIPTION

Technological and scientific progress has changed markets and attracted increasingly high amounts of investment. Education has moved towards emphasizing STEM (science, technology, engineering, and mathematics) fields. Liberal arts meanwhile has become less important in the minds of many. With artificial intelligence potentially replacing many coding, technological, and scientific skills, liberal arts might become a crucial part for advancing humanity and societal advances.

DATA POINTS

- “Nvidia CEO predicts the death of coding — Jensen Huang says AI will do the work, so kids don’t need to learn” (TechRadar, 26 February 2024)
[Read More](#)
- “Opinion: The Risk of Teaching CompSci Without Liberal Arts” (Government Technology, 27 March 2024)
[Read More](#)
- “Millionaire Entrepreneur Reveals No 1 Skill For The AI Era. It’s Not Coding” (New Delhi Television (NDTV), 15 April 2024)
[Read More](#)
- “The untapped power of emotional intelligence for PhDs” (Chemistry World, 26 April 2024)
[Read More](#)
- “Embracing the Social in Social Science” (Issues, VOL. XL, NO. 3, Spring 2024)
[Read More](#)

SIGNALS OF CHANGE

The Marriage of Robotics and GenAI



PREMISE

Advanced robotics can combine with generative artificial intelligence to enable new applications and improve on current operations—issues might exist.

DESCRIPTION

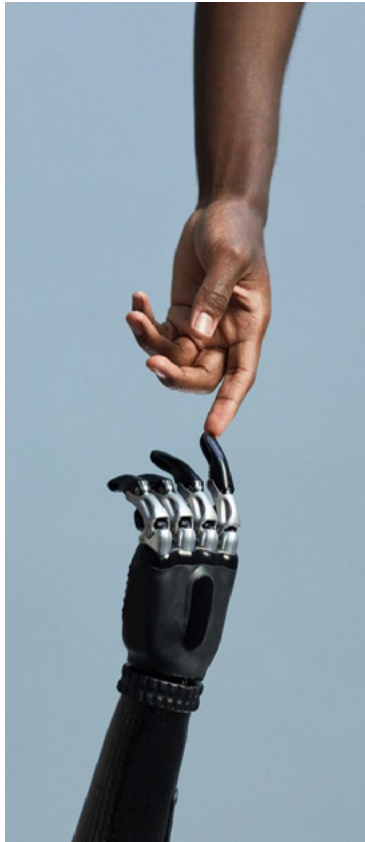
Generative AI has proven beneficial in improving a wide range of applications. Now, developers consider the technology to advance robotics. GenAI could not only improve applications but also allow robotic applications to become independently acting agents.

DATA POINTS

- “Combining robotics and ChatGPT” (Innovations Report, 30 April 2024)
[Read More](#)
- “Natural language boosts LLM performance in coding, planning, and robotics” (MIT News, 1 May 2024)
[Read More](#)
- “What’s next for generative AI: Household chores and more” (MIT Management Sloan School, 7 March 2024)
[Read More](#)
- “NVIDIA invests in AI-powered weed zapping ag-tech startup Carbon Robotics” (Geek Wire, 7 May 2024)
[Read More](#)
- “Swiss Start-Up Taking On The Tech Giants In Robotics And AI” (Forbes, 7 May 2024)
[Read More](#)

SIGNALS OF CHANGE

Humanoid Robots Stretch Commercially



PREMISE

Humanoid robots—robots with human features—are increasingly touted as a new market opportunity.

DESCRIPTION

Companies are working on humanoid robots, manufacturers are piloting these robots in their operations, and software developers are attempting to increase humanoid robots' capabilities. Such robots can utilize an extensive infrastructure—the infrastructure designed and built for humans.

DATA POINTS

- “Humanoid robots will join BMW’s production line” (Axios, 23 January 2024)
[Read More](#)
- “China’s home-grown general-purpose humanoid jogs out at 6 km/h” (New Atlas, 7 May 2024)
[Read More](#)
- “GR-1 humanoid takes multi-camera view of the world around it” (New Atlas, 24 June 2024)
[Read More](#)
- “Autonomous humanoid robot shadow-boxes, but kung fu is weak” (New Atlas, 22 June 2024)
[Read More](#)
- “A scalable reinforcement learning–based framework to facilitate the tele-operation of humanoid robots” (Tech Xplore, 6 April 2024)
[Read More](#)
- “Nvidia announces ‘moonshot’ to create embodied human-level AI in robot form” (Ars Technica, 20 March 2024)
[Read More](#)

SIGNALS OF CHANGE

Photographic AI—AI’s Mental Pictures



PREMISE

Artificial intelligence is creating photographic evidence from memories and past events that never got captured photographically.

DESCRIPTION

AI can help create photos of events from memories and the past that were not captured photographically at the time. Accuracy and authenticity are a consideration; falsification of events—by mistake or on purpose—are a real possibility. Even family members might not be able to tell falsified evidence of their loved ones’ appearances as an artist’s mother can attest to.

DATA POINTS

- “This company uses AI to create photos out of nothing but your memories,” (BGR, 13 April 2024)
[Read More](#)
- “Katy Perry’s own mom fell for her Met Gala AI photo. Do you know what to look for?” (National Public Radio (NPR), 7 May 2024)
[Read More](#)
- “Synthetic memories: Piecing together the past with AI,” (Quartz, 17 January 2024)
[Read More](#)
- “A.I. Is Coming for the Past, Too,” (New York Times, 28 January 2024)
[Read More](#)

STUDY

The Consumer Metaverse



CONSUMERS IN THE IMMERSIVE DIGITAL WORLD

Foresight Project

Future Watch

This foresight project explores the potential expansion and evolution of the metaverse and how it might transform the methods by which consumers engage in shopping, socializing, and finding significance in their digital interactions.

[Full report here](#)

This report has been prepared by Copenhagen Institute for Futures Studies for Business Finland

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STUDY

The Future of the Metaverse



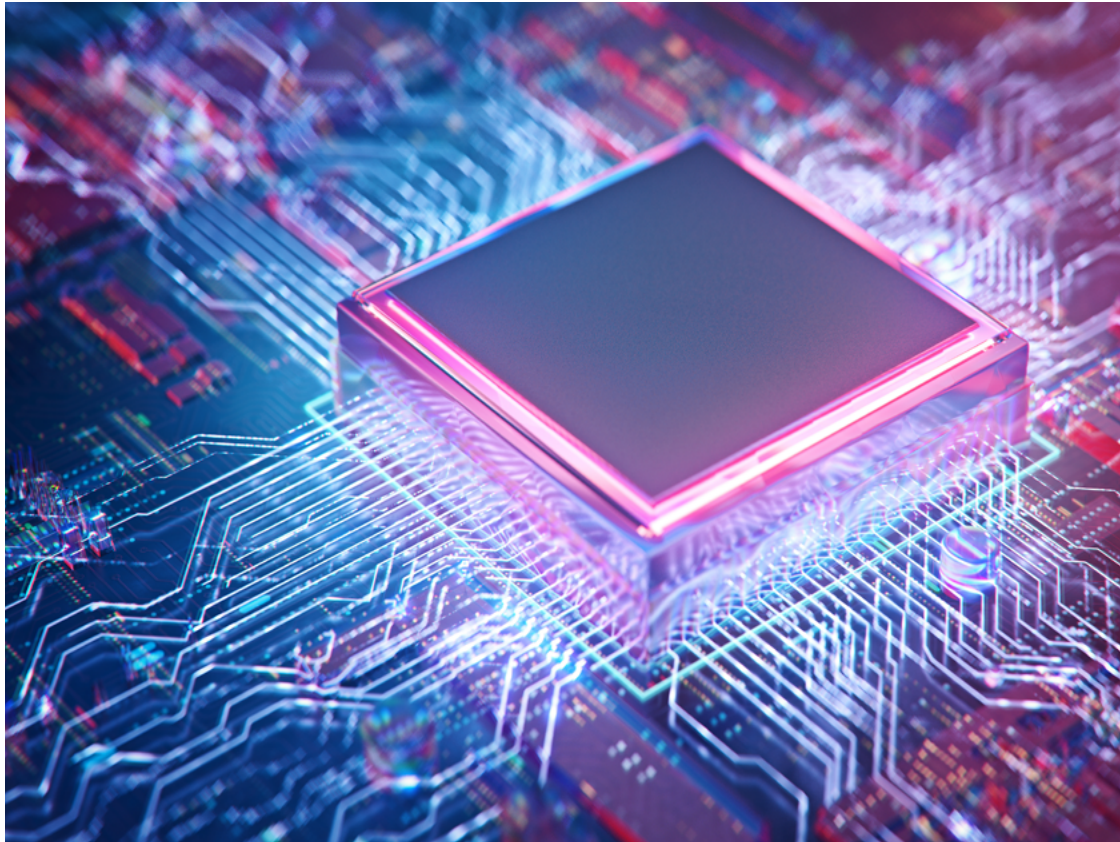
The future of the metaverse is about direction, not just the current technologies. The technologies we use today are merely tools that will evolve and be replaced over time.

The true essence of the metaverse lies in its trajectory – how it grows, adapts, and integrates into the fabric of our digital lives.

By employing foresight methodologies, we aim to map the rapidly expanding landscape and use cases of the metaverse, looking for directions which will enable businesses to be prepared for customer behaviour from a short- and long-term perspective.

STUDY

Uncertainties Shaping the Consumer Metaverse



For Finnish businesses to navigate the potential futures of the consumer metaverse, we identified the following critical uncertainties in this project as having the most significant impact on the development.

Speed of Adoption

High Speed vs. Slow Speed of Adoption

Engagement in Immersive Experience

Driven by community vs. immersive interfaces

Role of Finnish Businesses

Content providers/users of services vs. providers of software/hardware

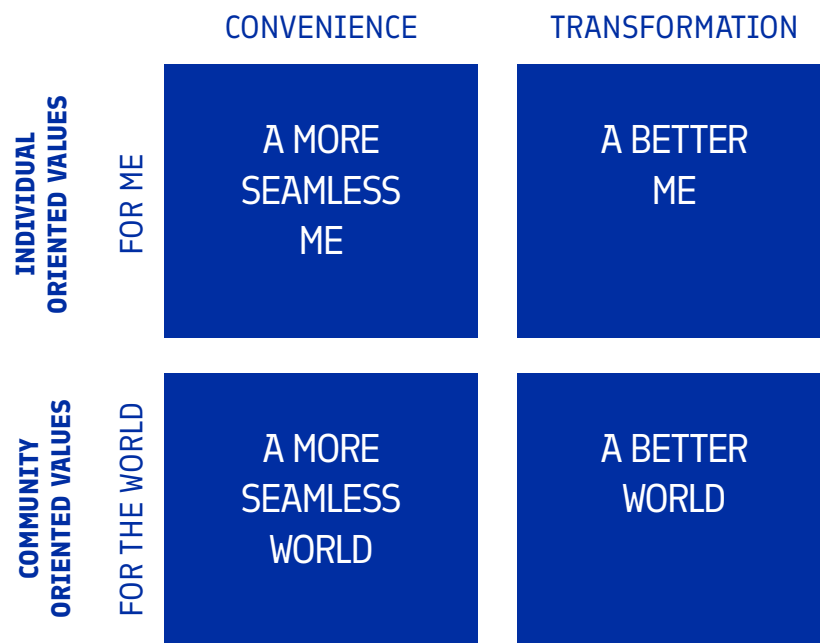
Regulations in the Consumer Metaverse

Heavily vs. moderately regulated

[Read More](#)

STUDY

The Future Consumer



"The Liquid Consumer Matrix", Copenhagen Institute for Future Studies

Two major competing trends are shaping the future belief systems specifically: more community or individual-oriented values driving behaviour, needs, aspirations and lifestyles.

- Liquid consumers prioritize convenience, real time personalization, and seek to align purchases with personal values and societal impact.
- They desire experiences that foster both self-improvement ("A better me") and societal contribution ("A better world").
- With the decline of traditional social norms, consumers are empowered to define their identities, yet risk being overwhelmed by a myriad of choices.
- The demand for seamless experiences is driven by technology and AI, which anticipate needs and offer tailored experiences.
- Preparing for the future also means embracing the fact that consumers are no longer constrained to one physical person but will have multiple representations in both virtual in-person avatars and as virtual AI agents acting on the consumers behalf.

Read in more detail: [Future Watch: Consumer Metaverse – Consumers in the immersive digital world 2/2024 - Business Finland](#)

FOCUS

Emerging Climate Tech



FUTURE WATCH PROJECTS 2024

Data-Driven Tech Research for Business Finland by Catapult

A pilot project delves into climate technology advancements across manufacturing, mobility, and city environments, exploring both emerging and strengthening technologies globally. The report serves as a tool to assess the global position of Finnish technology and inform future innovation strategies.

The project is part of the pilot, where Business Finland explores new tools and methods for supporting customers with foresight #zero carbon future mission #zero waste mission.

[Read More](#)

FOCUS

Resilient Landscapes



This segment consists of **technologies that aim to create and conserve secure, responsive and adaptable environments in the era of climate change and extreme weather.** Optimised built environments and mobility, availability of critical resources, circularity and self-sustaining buildings are core themes in this segment.

The early findings have been divided into the following categories:

Environmental Monitoring & Response

Climate-Adaptive Technology

Sustainable Cities

Circularity

FOCUS

Emission Management



Sensors are increasingly crucial for gathering and transmitting real-time data, enabling organizations, for example, to optimize energy consumption instantly. **Digital twins are emerging technologies enabling organisations to model, analyze, and improve operations and resource consumption.**

However, a major challenge is acquiring high-quality vendor data, especially on scope 3 carbon emissions, which form the bulk of an organization's carbon footprint but often lack adequate reporting.

Some emerging approaches and technologies in this field include:

Centralised Data Platforms

Distributed Ledger Technology

QUARTERLY FORESIGHT

FALL 2024

BUSINESS FINLAND

From possibilities to breakthroughs

Business Finland is an accelerator of global growth. We create new growth by helping businesses go global and by supporting and funding innovations. Our top experts and the latest research data enable companies to seize market opportunities and turn them into success stories.

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