



BODY SNATCHERS

The promise and perils experiencing health
and technology

EXPERIENCE FORESIGHT
THE NORDICS
2024—2034

CEIST

Title: Body Snatchers: The promise and perils of health and technology in the Nordics

Authorship: Sérgio Tavares (curation, prompts, methodology). Content written and/or augmented by GPT-4 (Generative Pre-trained Transformer 4), by OpenAI LP.

Cover image and book images generated with MidJourney. Vintage illustrations created by DALL-E 3, by OpenAI LP.

Publisher: Geist Media / Geist Institute

Publisher identifier: 978-952-7588

Publication Date: Winter 2023 / December 2023

ISBN (print): 978-952-7588-01-7

ISBN (digital): 978-952-7588-00-0

Language: English

Pages: 127

Publishing electronically in PDF file format and in print paperback.

Dimensions: 165mm x 225mm

Filesize (Bytes): 45MB approx.

Licensed under a Creative Commons License

Body Snatchers: Promise and Peril in Health and Technology © 2023 by Sérgio Tavares, augmented by OpenAI. is licensed under Attribution 4.0 International

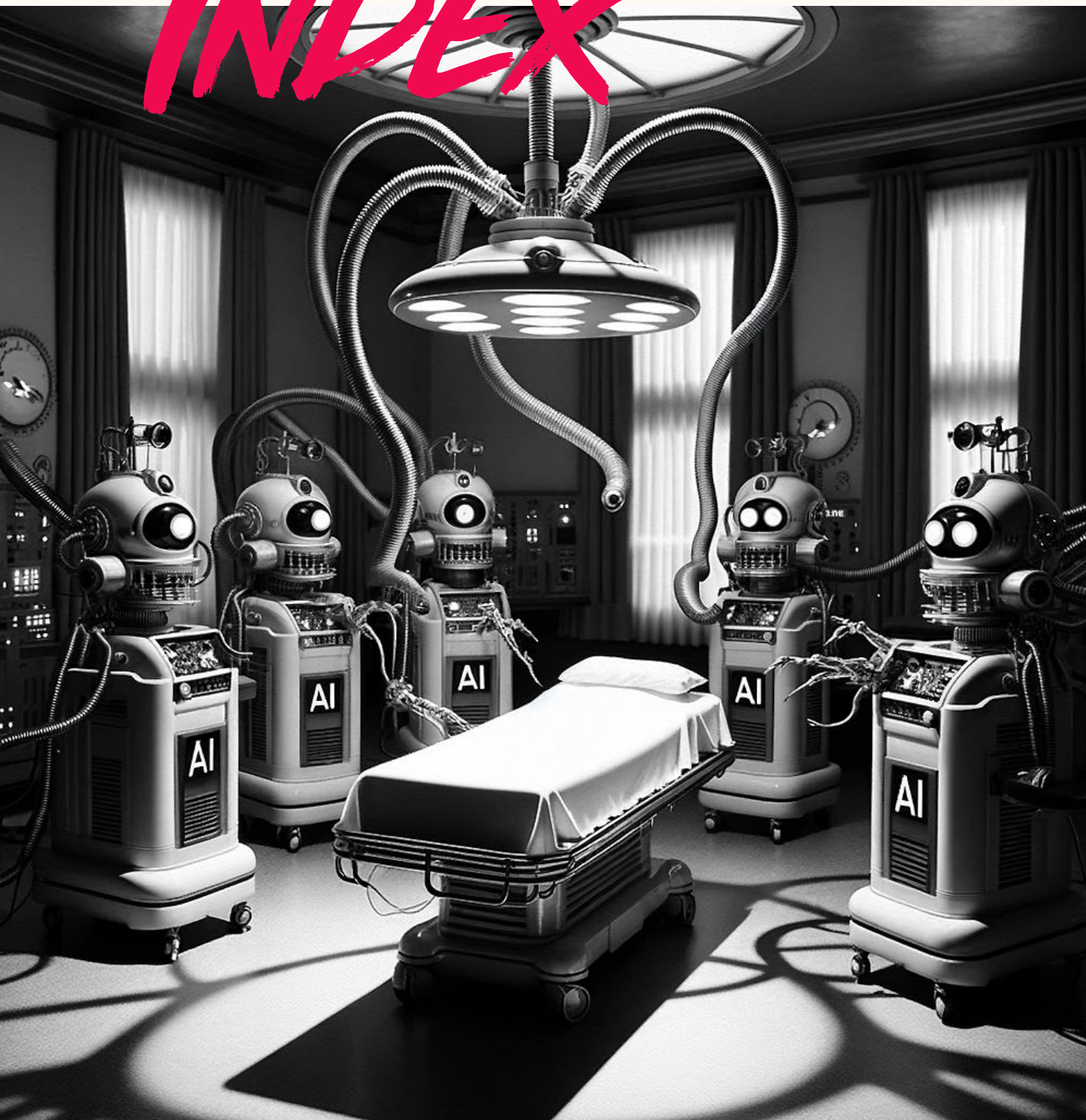


BODY SNATCHERS

THE PROMISE AND PERILS OF HEALTH & TECHNOLOGY IN THE NORDICS

GEIST
CULTURE DESIGN TECHNOLOGY

INDEX



Introduction

8

Experience

26

Strategy

42

Foresight

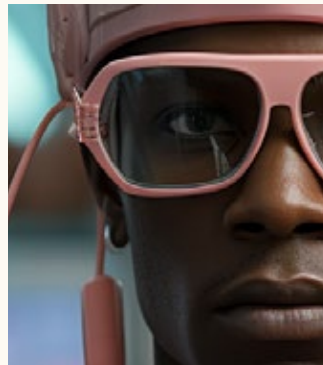
78

Design

102

Conclusion

122



For an experience-aware design practice

These reports are made to push designers, innovators, and strategists to look beyond the surface, and consider the deeper implications of their work.

We live in a time marked by significant challenges: climate change, global health crises, international conflicts. Amid these, technology makes us hopeful.

So we are inviting you to engage with technology thoughtfully, and to consider the broader ramifications of our creations.

The word we introduce here is postphenomenology. Put simply, it is the study of the relationship between humans and technology — the experience of technology.

Henceforth, the reports offer an end-to-end framework to navigate your own design process with awareness of these experiences.

This makes the process experience-centric, in the sense that we consider strategic opportunities the ones with openness to new technological experiences.

But a serious strategic foresight, even if focusing on accuracy over precision, shouldn't exist without good real numbers about the present. We present numerous market statistics, selected from reliable sources used in the consulting industry. The difference is

we cross-examine it with the way experiences shape these projections.

There are also many qualitative examples from the market, algorithmically selected by AI by "growing and proactive" companies, "socially relevant" and other subjective terms that made exciting selections for our curatorship.

In order to plan ahead, and also to do it critically, we populate the future with speculative ideas, so that we understand perils and promises in potential new technologies.

Lastly, we bring from the preferable futures — the one that is hard to achieve, but worth trying — numerous "Requests for Proposals" that designers may see in the upcoming years. We called them playfully of Requests from the Future (RFFs). These give a concrete dimension of possible needs, risks and opportunities of innovation in the field.

Each new technological application reshapes our relationship with the world —and with ourselves. It's part of the creator's job to understand what should and should not happen next.

We hope this volume can kick off your doing with a fresh new layer on your thinking — you know better how to take it from there.

This volume examines our experience of health and technology. Upcoming six volumes of this series will examine our relationship with technology with identity, relationships, access to information, work, leisure, and our habitat.

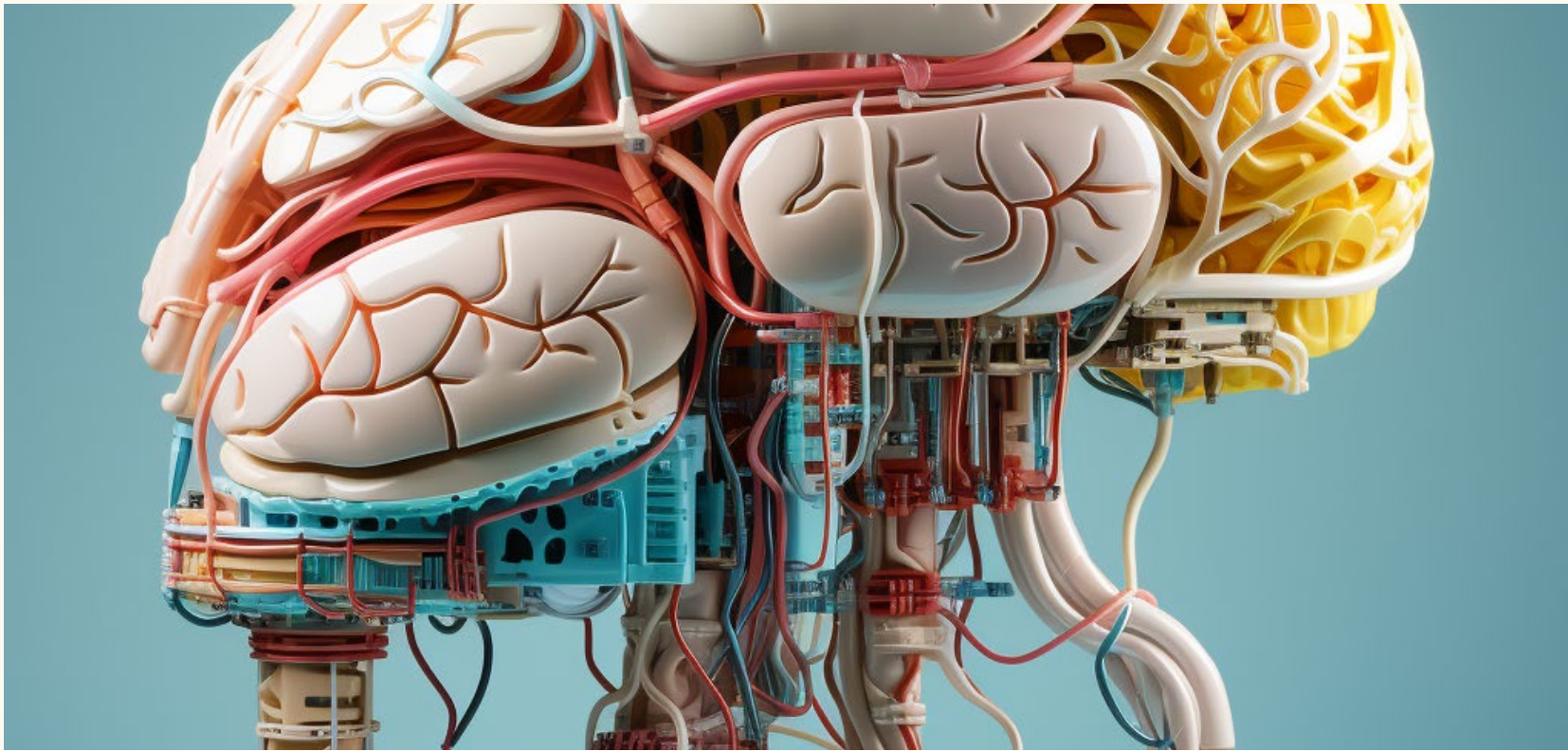
The focus of this series is on the Nordics, with foresight from 2024-2034.



Sérgio Tavares
PhD | Editor at Geist



**INTRO
DUCTION**



We focus on the confluence of market growth and cultural opportunity.

Purpose

The first task of a designer-strategist is to understand the direction and velocity of a market landscape. The second, often neglected, is to grapple with the ways in which technologies mediate human experiences, shape cultures, and redefine our daily lives.

This book aims to bridge this gap. It offers a bookworm-turned-business-savvy vantage point, where market foresight meets a deeper understanding of the human condition.

The works introduce an approach that combines market projections with post-phenomenological perspectives to identify what we term as the ‘sweet spot’—the confluence of market growth and cultural opportunity.

Furthermore, the framework expands the scope of opportunities, by illuminating areas that might have been overlooked in a purely market-driven or culturally insular strategy.

A new health tracker is not just an output of data. A tele-health consultation is not just a shortcut to the doctor. The first creates a new relation with your own body, a new sense of control over it. The latter, a new cognitive and emotional relation with the interface that will tell “you’re healthy” or “you’re sick”. And both operate under the impending possibility of being surveilled, of having your data leaked, or your profile data sold. This framework brings a sobering awareness to the act of designing technology.

We invite you to go beyond the surface-level trends and patterns to uncover opportunities that resonate on a more profound, human level. In doing so, this book equips you with the intellectual and practical tools to not just navigate but also shape a world where technology and humanity shape one another in realistic, equitable, and preferable ways.



Analytical principles

In order to analyze and affect the future of how we experience technology, the book proposes four dimensions of analysis: experience, strategy, foresight and design.

Experience

Experiencing the world with technology.

This helps us to organize big groups of experience, such as our relation with health systems, work systems or living and lifestyle

Strategy

Thinking strategically to make viable experiences.

This matters because we want to understand who can help and how we can change the state of things

Foresight

Imagining the future, based on market and culture demands.

This matters because we want to understand the possibilities ahead and prepare for them

Design

Shaping the future.

This matters because we want to understand the path forward, the pitfalls and how to actualize the future

Applicability and benefits

Design asks: How might we?

Strategy asks: What would need to be true?

We are asking: What is it like?

Research and analysis

The analytical frameworks provided in this book can help designers hone their research and analysis skills, which are crucial for understanding user needs, market movements, feasible innovation and possible futures.

Innovation in services and products

This frameworks for analyzing technology's role in various realms (relationships, information consumption, identity, work, learning, Play, environment) can serve as sources of inspiration for designers. They might uncover new opportunities for innovation that they hadn't considered before.

Strategic foresight

By understanding the potential future scenarios for The Nordics, designers can anticipate how trends in technology might impact future behaviors and markets, enabling services that remain relevant and valuable over time.

Context awareness

Understanding how technology shapes our perception of the world can help designers understand the broader context in which their designs exist. This can lead to the creation of products or services that are more aligned with the real-world experiences and needs of users.

Ethical considerations

This book's discussion of how technology mediates our experience of the world could help designers consider the ethical implications of their designs. This is increasingly important in a world where technology plays such a central role in our lives



Experience

Dimensions of our experience of the world, to better understand our relationship with technology

This report is about one of the dimensions of our experience of the world with technology: the dimension of health.

In total, we work with seven dimensions of experience, covered in upcoming reports.

Not only have we been born in a technology-first world, the times are such that we are inebriated by the wonders created by what capital and technology at scale can bring.

The role of technology in shaping our lived experiences is, thus, less observed. Much like fish unaware of the water they swim in, we often overlook the pervasive role of technology in shaping our lived experiences.

That's when this book comes into play. Here we will take the role of technological artifacts and systems in shaping human perception, interaction, and understanding into the equation of feasibility, viability and desirability of launching new services into the world.

We will delve into how technology acts as a mediator between humans and the world, influencing not just what we do but how we think, feel, and make sense of our surroundings — and of ourselves. This framework goes

beyond the mere functionality of gadgets to explore the subtle and often overlooked ways in which technology is integrated into the fabric of our daily lives.

Self-aware design

Understanding postphenomenology is crucial for designers and strategists because it offers a richer, multi-layered perspective on user experience. In an age where technology is deeply woven into the social and cultural fabric, a postphenomenological approach allows for the design of products and strategies that are not only efficient but also meaningful. It provides the tools to move beyond surface-level analytics and delve into the more intricate aspects of how individuals engage with technology, thus creating solutions that are both impactful and deeply resonant with users' lives.

Health and technology: a designer must realize that a new health service is, in fact, the creation of a new relation with the user, their own body, their self-awareness, their awareness of performance and even mortality.



Health and technology

The ways medical technology changes our experience of health. How do fitness trackers or health apps alter our awareness and management of our health? How do telehealth platforms reshape the patient-doctor relationship and our experience of care?

Other dimensions of our experience of technology

Drive

Drive refers to motivation or ambition, looking at how technology influences our goals and efforts. How do productivity apps or remote learning platforms shape our motivations and our sense of achievement?

Play

How technology affects our experience of entertainment. How do video streaming services change our viewing habits and experiences? How do video games create new forms of play and relaxation?

Habitat

How technology changes our experience of our living spaces. How do smart home devices alter our interactions with our home environment? How do mapping apps or geolocation services change our understanding and navigation of our neighborhoods and cities?

Self-concept and identity

How technology influences our self-perception and identity. For instance, how do social media platforms shape our understanding of ourselves? How do AI assistants reflect or alter our sense of identity?

Informationals

How do information technologies alter our access to and understanding of information? How does the internet change our research habits or our trust in different sources of information?

Relationals

This category explores how technology mediates our relationships with others. How do communication technologies shape our interactions and relationships? How do virtual reality or augmented reality affect our sense of presence and connection with others?

Strategy

Understanding the ecosystems, culture, markets and businesses that affect our experience of the world

The data collected is from statistics and market examples from the Nordic region. We have also included numerous case studies and innovative edge cases to inspire thought and action.



Social ecosystem

Social ecosystems are institutions that are intertwined, either explicitly or indirectly, affecting a society. They include organizations, policies, bureaucratic systems, communication channels and authorities or influencers in certain areas of society.

Drivers

A market driver is a factor or force that stimulates growth, demand, or development within a specific industry or market sector, influencing the overall performance and expansion of the market. Those include technological advancements, changes in consumer preferences, demographic shifts, government regulations, and economic trends.

Market growth

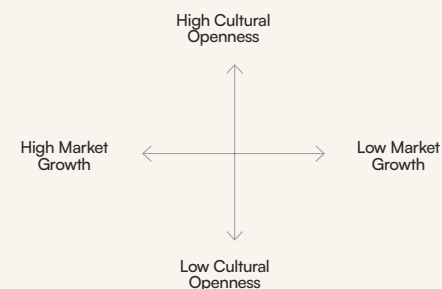
Understanding where investments are going and the tendency for their growth is a seminal step to understand what are the possibilities within the futures, and how to better estimate how futures are likely to happen.

Business ecosystem

The network of interrelated actors—businesses, suppliers, distributors, competitors, regulatory agencies — that create a specific economic community. This network is bound by the value they collectively create and distribute.

Signals

Signals are early indicators or signs that point to emerging trends, opportunities, or disruptions within a particular industry or market. These signals are usually weak and subtle at first but, when recognized and interpreted accurately, can provide valuable insights into the direction of future developments.



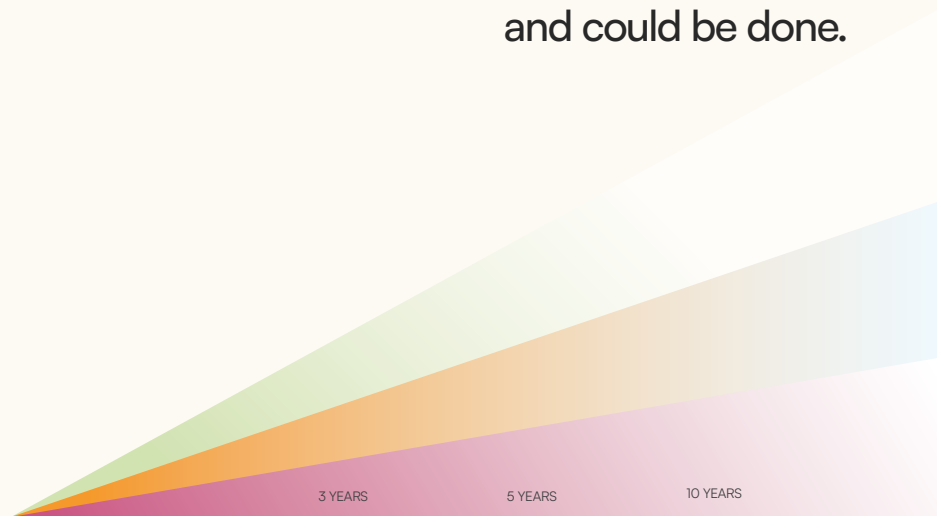
The Sweet Spot for Experience = Openness to technology x Market Growth

We call this framework Culture-Market Intersection Matrix, and it helps us to identify areas progressing in development and acceptance.

Foresight

Imagining along the diverging paths ahead of us

Likely and unlikely scenarios are described to initiate readers into a state of creativity, questioning and expanding the boundaries of what should and could be done.



The headlights

Navigational tool This concept is a navigational tool that helps us anticipate and prepare for possible future scenarios. Also called as the “future cone,” it represents the widening spectrum of potential futures that become more uncertain as we project further ahead in time.

Near and far futures At the near end of the headlights, the future is relatively clear and predictable, while as we look further down the road, it becomes increasingly hazy and open to various possibilities.

We work with three timespans: 3 years, 5 years and 10 years.

Applicability Designers and strategists can make informed decisions in the present, recognizing the need for flexibility and adaptability as they approach the uncertain terrain of the future.

The futures

Dystopias These are grim, nightmarish scenarios that explore the consequences of certain trends or choices. They serve as cautionary tales, highlighting what might go wrong if action isn’t taken to steer the course of events.

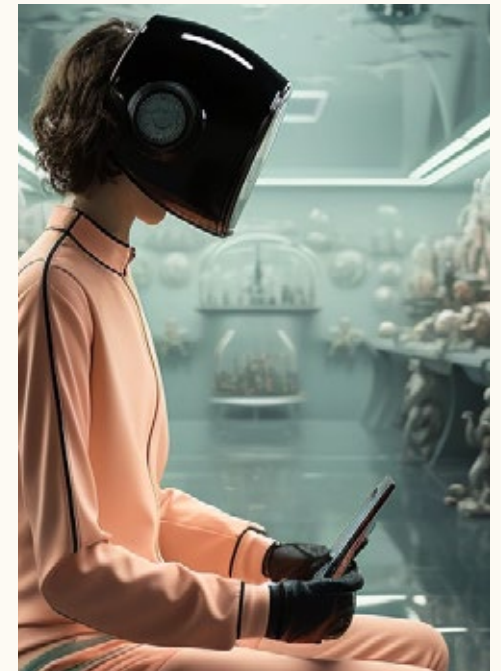
Utopias These are idealized scenarios where everything goes as well as it possibly could, often serving as aspirational goals. Like dystopias, they may not be entirely realistic but serve to explore the best-case outcomes of various choices and paths.

Probable Futures These are futures that are most likely to occur, given current trends and trajectories. Probable futures often rely on statistical data and current technologies to provide a realistic forecast of where we are headed.

Possible Futures These are futures that could occur but aren’t necessarily likely, based on what is technically or scientifically possible today. They can be either optimistic or pessimistic but are not constrained by what is currently probable.

Plausible Futures These are futures that are not only possible but also could logically occur given certain conditions. They consider a broader range of variables, from social trends to technological advances, to construct a future that is consistent with our understanding of how the world works.

Preferable futures These are explored as a Design activity.



If telehealth becomes the norm as first line of care, what happens to professionals who never expected to be behind screens most of their day?

Design

Designing the future ahead by understanding what needs to be true, who needs to be involved and what needs to be done

The preferable future

The preferable future is the envisioned and desirable outcome that individuals, designers, and strategists aspire to shape. It serves as a guiding vision for designing a future that aligns with our values, aspirations, and objectives. By envisioning this preferable future, designers and strategists gain a clear direction and purpose in their work. They can use it as a blueprint to inform decisions, set goals, and create innovative solutions that actively contribute to realizing that vision. In essence, the preferable future acts as a compass, helping designers and strategists navigate the complexities of the present and guide their actions toward constructing a future that reflects the best possible outcomes, whether in health, technology, or any other domain.

Scenarios

Scenarios are narrative descriptions of plausible and alternative future states, situations, events or inventions. They are not predictions, but rather structured explorations of how the future might unfold.

They help us navigate uncertainty by providing a framework for envisioning multiple potential outcomes. By creating different scenarios, one can consider a range of possibilities, anticipate challenges and opportunities, and make more informed decisions in the present.

Scenarios are valuable tools for strategic planning, risk assessment, and long-term visioning, allowing for a deeper understanding of the complexities and uncertainties inherent in shaping the future.

Requests from the future

To spike interest and ideas for new projects, we have created numerous Requests from the Future (“RFFs”) that can help to build a preferable future for health and technology in the Nordics. Requests from the Future are a playful parody for “Requests for proposals”, that is, requests a company or entity poses to the market in order to get ideas, concepts or solutions to needs they have. RFFs serve as a speculative exercise that delves into the kinds of projects companies are likely—or should be—requesting in the near future. Focused on strategic and design agencies, these Requests for Proposals (RFPs) are imagined blueprints that guide the conception and implementation of services designed to build a more equitable, efficient, and human-centered healthcare landscape in the Nordics. By considering these RFPs, we can explore the potential pathways for leveraging technology to create a preferable future in health and well-being.

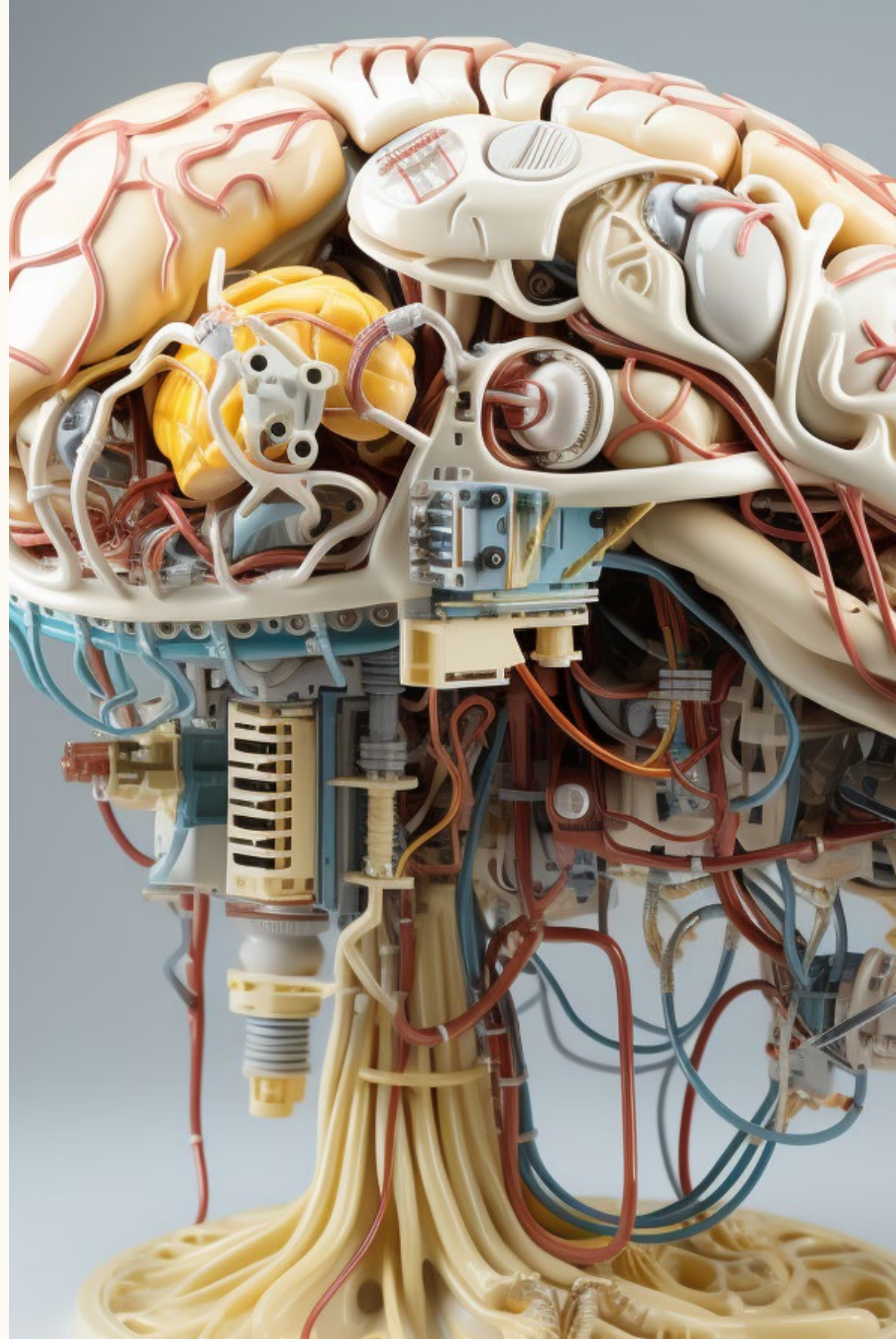


These are speculative health pods distributed along mid-sized cities in developing countries. They are built as a convergence of global software companies, Nordic healthcare networks, local manufacturers and governments. How aren't they desirable, viable or feasible?

A bold mix of imagination and real-world data is infused at each chapter. The goal is to imagine the desirable, but advance the thinking towards what is viable and feasible.

Navigation elements

-  **Internodes** Contributions from experts, professionals, academics and other luminaries to connect topics, theory and practice
-  **Pathways** Defining choices from main stakeholders at a certain point in time that can modify future trajectories
-  **Sources** References from academic, professional and other published sources, consulted by Artificial Intelligence at the date of this project.
-  **Insights for opportunities** The alert icon indicates insights applicable to commercial activity in the market, today and in the upcoming years.





EXPERIENCE

What is it like?

A field guide for technology and health experiences

The dimensions of experiences in health and tech come from philosophical studies, and are enlightening to anyone designing solutions that connect people and technologies.

Experience criteria for health and technology

As seen in the previous chapter, the experience of technology has seven criteria: Identity, Health, Relationals, Informationals, Drive, Play and Habitat.

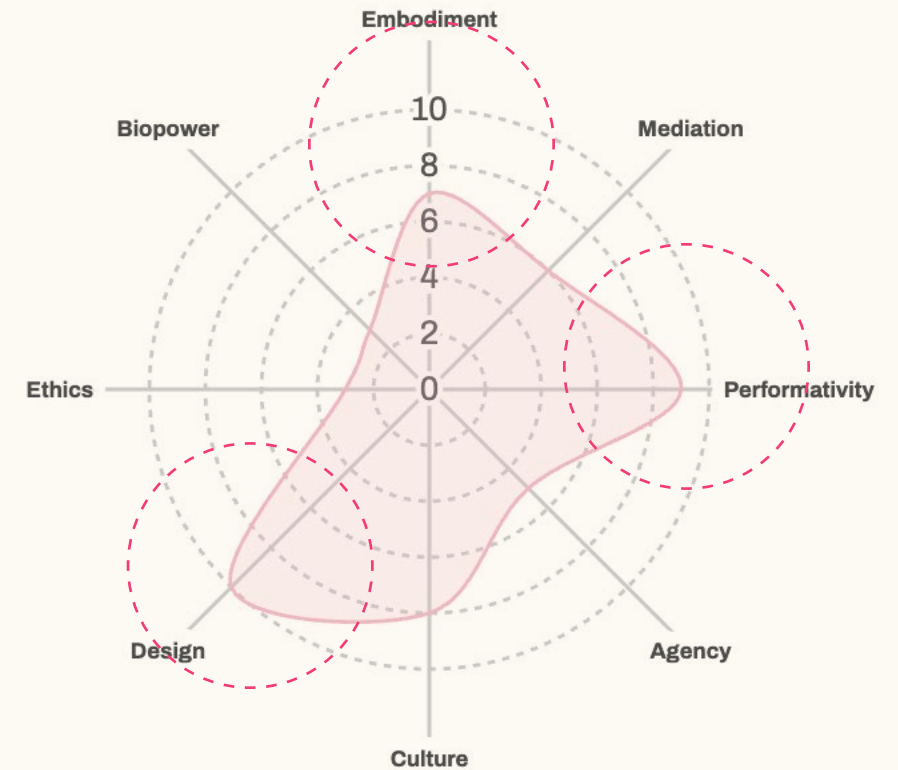
Within “Health”, the experience of technology happens in several ways. We have elected eight criteria that may be helpful for designers to know about and reflect upon when designing new services and products, as well as strategists planning which opportunities to explore.

The criteria of Embodiment, Mediation, Performativity, Agency, Cultural Values, Design, Ethics and Biopower are critical lenses through which we can better understand the relationships between technology, health, and human experience. Rooted in postphenomenology, these criteria offer a nuanced approach to evaluating how technologies are active mediators in shaping our experiences with health and technology.

Criteria	DESCRIPTION
Embodiment	Understanding how technology becomes an extension or a limitation of our physical selves is crucial in designing products that seamlessly integrate with human physiology and behavior.
Performativity	This criterion speaks to how technologies are incorporated into daily practices and rituals. Strategists must consider how a product fits into, or perhaps changes, the end-user’s routine and lifestyle.
Mediation	Technology serves as a mediator in how we perceive and interact with the world. For designers, this means creating interfaces and functionalities that are transparent and respectful of user autonomy.
Cultural values	Technology is not culturally neutral. Being aware of cultural sensitivities and norms can lead to more inclusive and effective designs, especially in global or diverse markets.
Design	Beyond aesthetics or usability, the design involves making ethical and practical choices that align with user needs and societal values. It is a holistic approach to solving real-world problems.
Agency	Knowing the level of control and autonomy that a user has when interacting with a technology can guide designers in building products that empower rather than overpower the user.
Ethics	Ethical considerations are paramount, especially in healthcare where sensitive data and human well-being are involved. This includes considerations about privacy, security, and equitable access.
Biopower	This criterion is about understanding the ethical and societal implications of having the ability to control biological aspects of human life through technology. This is particularly relevant in healthcare settings where the stakes are high.

Synthetic assessment

Criteria	Comment	Score
Embodiment	Nordics are generally open to wearables and health-monitoring devices, valuing their potential for enhancing well-being.	7
Mediation	While HealthTech records and online platforms are embraced, there's a conscious effort to ensure transparency and accuracy.	6
Performativity	The integration of tech tools like meditation apps into daily routines is widely accepted, given the region's tech-forward approach.	9
Agency	There's appreciation for personalized health solutions, but also a desire to retain individual autonomy and control.	5
Cultural values	The blend of tech with cultural practices is generally positive, though traditions and local values remain important.	8
Design	A strong emphasis on user-centric, intuitive design aligns with Nordic values of simplicity and functionality.	10
Ethics	High standards for ethical considerations, especially data privacy, can sometimes slow down tech adoption.	3
Biopower	While there's an acknowledgment of the benefits of health tech, there's also a conscious effort to ensure equitable access and avoid power imbalances.	3



Assessment of cultural openness to technology in the Nordic countries, by advance data analytics algorithm. OpenAI, 2023. Dashed highlights show areas of interest for design, strategy and innovation work. Dips in the graph show need of cultural transformation.

Synthetic assessment of the openness to technology in Nordic countries

Derived from the sociocultural profile of the Nordic countries, this table provides a speculative rating on technology acceptance across key criteria. By intertwining historical insights, OCEAN personality scale references, and regional tech tendencies, we offer an AI-simulated result of the research: a synthesized perspective on the Nordic populace's openness to intertwining technology with health and technology.

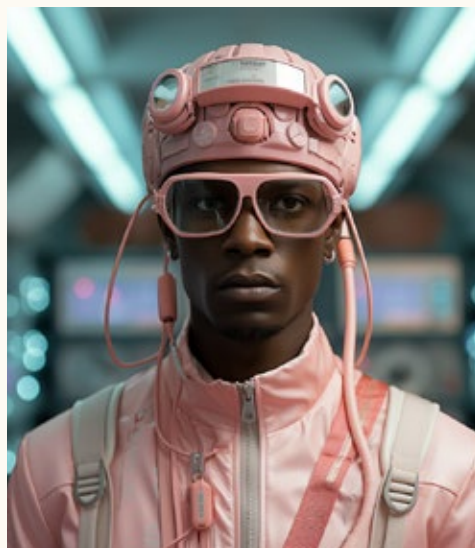
A culture with design and productivity enmeshed with their cultural values speaks up. The most critical issues relate to what, who and how can we trust technology, today and tomorrow.

Insights on assessment

The Nordics are not afraid of technology, but of who owns them

Receptive societies...

In evaluating the “Technology Acceptance Assessment” for the Nordic region, several illuminating insights emerge. The high scores in criteria such as “Embodiment,” “Performativity,” and “Design” indicate a strong Nordic inclination towards technologies that seamlessly integrate into daily routines, enhance physical and mental well-being, and prioritize intuitive, user-centric design. This underscores the region’s forward-thinking approach to HealthTech technologies, emphasizing tools that enrich daily life and are rooted in practicality. For strategists and innovators, this suggests that solutions which align closely with these values—simplicity, functionality, and enhancement of everyday experiences—are likely to resonate deeply with the Nordic populace.



...but conscientious societies

However, the relatively lower scores in “Ethics” and “Agency” highlight the Nordic countries’ conscientious stance on data privacy, ethical implications, and individual autonomy. This suggests a careful balance between technological innovation and ethical considerations. Innovators should be prepared to address privacy concerns head-on, ensuring that technologies uphold the highest ethical standards. Additionally, designers should focus on creating tools that amplify, not overshadow, individual agency, allowing users to retain control and autonomy in their health decisions.

Further into the concept of openness to technology

In the book chapter “Openness to Innovation and Innovation Culture” by Martin Curley & Bror Salmelin, it’s stated that openness to innovation requires courage to seek the new which might lead to disruptive solutions¹. The culture of an organization or society is a critical factor in innovation success¹. The ‘openness’ of an organization or society’s culture to change and innovation is critically important to the creation and co-creation rate but particularly to the adoption of innovations¹.

An article on Opensource.com titled “Openness is the key to innovation, history shows” argues that history demonstrates the kinds of organizational structures that foster innovation: open, communal, and humble². It mentions that innovation is mostly a “bottom-up phenomenon” and that small, loosely assembled communities (open organizations with front line teams) have been more innovative throughout history².

In the article “Science, Technology and Innovation as Social Goods for Development”, it’s suggested that developing societies must not be excluded from the benefits of Science & Technology (S&T), and this can be achieved through approaches that pay enhanced attention to increasing access and exposure to scientific information while also fostering homegrown processes and structures that facilitate the production, translation, and utilization of tacit, situated forms of knowledge³.

These sources collectively emphasize the importance of openness to innovation in driving societal development.

Controversially and, to an extent, disputed, Jared Diamond’s work in “Guns, Germs, and Steel” touches on the importance of factors like innovation and technology in shaping societies and their current developmental status.

The significance of openness to innovation for societal development is further debated in business books — and this is to close the loop from the primitive openness to contemporary openness to innovation and technology.

“The Innovator’s Dilemma” by Clayton M. Christensen explores the concept of disruptive innovation and its critical role in the development of industries and societies. It discusses how established companies can often fail to embrace disruptive innovations, leading to their decline, while new, more innovative entrants can drive societal progress.

Also, “The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies” by Erik Brynjolfsson and Andrew McAfee discusses the profound impact of technological innovation on economies and societies, emphasizing the importance of openness to innovation and technological progress for economic growth and development.

Sources

Diamond, Jared. “Guns, Germs, and Steel: The Fates of Human Societies.”

Christensen, Clayton M. “The Innovator’s Dilemma.”

Brynjolfsson, Erik, and Andrew McAfee. “The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies.”

“Openness to Innovation and Innovation Culture | SpringerLink.” SpringerLink. https://link.springer.com/chapter/10.1007/978-3-319-62878-3_13.

“Openness is the key to innovation, history shows.” Opensource.com. <https://opensource.com/open-organization/20/12/open-innovation-history>.

“Science, Technology and Innovation as Social Goods for Development.” Springer. <https://link.springer.com/article/10.1007/s11948-018-0037-1>.

“Innovation for Development - OECD.” OECD. <https://www.oecd.org/innovation/inno/50586251.pdf>.

Case study

Oura Ring

Finland

Oura Ring, developed by the Finnish health technology company Oura Health Oy, emerged in 2013 from the collaborative efforts of founders Petteri Lahtela, Kari Kivelä, and Markku Koskela.¹ Over the years, Oura Health Oy has attracted a total funding of \$148.3 million across nine rounds to propel its mission forward. The company recently secured \$100 million in a Series C funding round, which was led by the Chernin Group and Elysian Park, and saw participation from new investors like Temasek, JAZZ Venture Partners, and Eisai.³ 5

Functionality

The Oura Ring is a pioneering wearable designed to monitor an individual's health metrics, including resting heart rate, heart rate variability, and other biometrics such as body temperature and blood oxygen levels. It integrates daily physical activity and nocturnal cardiovascular measurements, offering a comprehensive insight into one's health behavior.⁶ 7 8

Technology embodiment

The Oura Ring, as a wearable technology, extends into the domain of embodied experience by continuously tracking and providing feedback on various health metrics.

It mediates the wearer's understanding and awareness of their own bodily states, thus fostering a deeper connection between the individual and their physical performativity

The continuous stream of data and insights provided by the Oura Ring enhances the wearer's ability to attune to their body's needs and responses, and creating a new sense of awareness of one's own body performativity, in-existent in natural bodies.

Design Features

The ring's minimalist design speaks to a desire for unobtrusive yet functional tech. Its discreet form factors allow for constant wear, affecting both the embodiment (it becomes a 'part' of the user) and the performativity (it 'nudges' behavior based on insights).

Future Implications

The Oura Ring sets the stage for how wearables can influence not just health metrics but deeper phenomenological experiences. It offers lessons on the importance of design in facilitating embodied interactions and performative changes.

Embodiment

Performativity



Sources

1. Crunchbase. "Oura - Crunchbase Company Profile & Funding." Crunchbase, www.crunchbase.com/organization/oura.
2. Wikipedia. "Oura Health." Wikipedia, en.wikipedia.org/wiki/Oura_Health.
3. Crunchbase. "Oura - Funding, Financials, Valuation & Investors." Crunchbase, www.crunchbase.com/organization/oura.
4. VentureBeat. "Smart ring startup Oura raises \$28 million from Google's Gradient..." VentureBeat, venturebeat.com/2018/03/14/smart-ring-startup-oura-raises-28-million-from-googles-gradient-ventures-jack-dorseys-square-and-forerunner-ventures/.
5. MobiHealthNews. "Health-tracking ring maker Oura Health lands \$100M." MobiHealthNews, www.mobihealthnews.com/news/health-tracking-ring-maker-oura-health-lands-100m.
6. IOPscience. "Feasible assessment of recovery and cardiovascular health." IOPscience, iopscience.iop.org/article/10.1088/2057-1976/ab8d6f.
7. Oura Ring. "Nonprofit Uses Oura in Study Aiming to Empower Women." Oura Ring, ouraring.com/blog/nonprofit-uses-oura-in-study-aiming-to-empower-women/.
8. Oura Ring. "Accurate Health Information Accessible to Everyone." Oura Ring, ouraring.com/oura-ring/.

Case study

Beddit

Finland

Beddit, a Finnish sleep tracking company, manifests its cultural and design roots through its evolution and product offerings.

Company Background

Beddit was founded in 2006 by Lasse Leppäkorpi, initially offering basic sleep monitoring solutions in hospitals, tracking patients' heart rates and breathing without contact. In 2013, the company transitioned to consumer products, launching a sleep tracker following a successful crowdfunding campaign. The company was later acquired by Apple Inc. in 2017, continuing to develop sleep tracking solutions under the tech giant's umbrella.

Nordic Cultural Values

Nordic culture emphasizes sustainable relationships with nature, gender equality, and social solidarity. These values often translate into design principles that prioritize simplicity, functionality, and a harmonious blend of aesthetics and practicality.

Design Values

Beddit's products reflect a Nordic design ethos that values user-centric, minimalist, and functional design. Their sleep trackers are crafted to seamlessly integrate into users' daily lives, embodying a form of 'silent design' that serves its purpose without demanding attention.

Cultural values

Design



Sources

1. Crunchbase. "Oura - Crunchbase Company Profile & Funding." Crunchbase, www.crunchbase.com/organization/oura.
2. Wikipedia. "Oura Health." Wikipedia, en.wikipedia.org/wiki/Oura_Health.
3. Crunchbase. "Oura - Funding, Financials, Valuation & Investors." Crunchbase, www.crunchbase.com/organization/oura.
4. VentureBeat. "Smart ring startup Oura raises \$28 million from Google's Gradient..." VentureBeat, venturebeat.com/2018/03/14/smart-ring-startup-oura-raises-28-million-from-googles-gradient-ventures-jack-dorseys-square-and-forerunner-ventures/.
5. MobiHealthNews. "Health-tracking ring maker Oura Health lands \$100M." MobiHealthNews, www.mobihealthnews.com/news/health-tracking-ring-maker-oura-health-lands-100m.
6. IOPscience. "Feasible assessment of recovery and cardiovascular health." IOPscience, iopscience.iop.org/article/10.1088/2057-1976/ab8d6f.
7. Oura Ring. "Nonprofit Uses Oura in Study Aiming to Empower Women." Oura Ring, ouraring.com/blog/nonprofit-uses-oura-in-study-aiming-to-empower-women/.
8. Oura Ring. "Accurate Health Information Accessible to Everyone." Oura Ring, ouraring.com/oura-ring/.

Case study

Corti AI

Denmark

Corti AI, a Denmark-based company, was founded on January 1, 2016, by Andreas Cleve Lohmann, Lars Maaløe, and Michael Boesen. The firm specializes in providing artificial intelligence (AI) support to healthcare professionals, particularly during patient consultations. Corti AI's main aim is to alleviate the burden on medical practitioners by offering a suite of tools that ease the administrative process, thereby giving healthcare professionals more time to engage with patients rather than paperwork or screens.^{1 2 3}

Corti AI secured \$27 million in a Series A funding round, followed by a substantial \$60 million in a Series B funding round, with the latter led by Prosus Ventures and Atomico. These funds have significantly propelled Corti AI's vision of augmenting healthcare consultations through AI.^{4 5}

Mediating health

Corti performs the mediating role technologies play between humans and the world, emphasizing the alteration in human-world relations due to technological mediation.^{6 7}

Corti AI embodies this mediation through its AI which acts as an extension to healthcare professionals during patient consultations. By automating and augmenting parts of the consultation process, Corti AI alters the dynamics of healthcare provision, fostering a collaborative environment where AI helps in triaging, note-taking, coding, and quality assurance.³ Moreover, its predictive capabilities, honed through analysis of vast amounts of patient consultation data, present a form of technological mediation, enhancing the interaction between healthcare professionals and patients.⁸

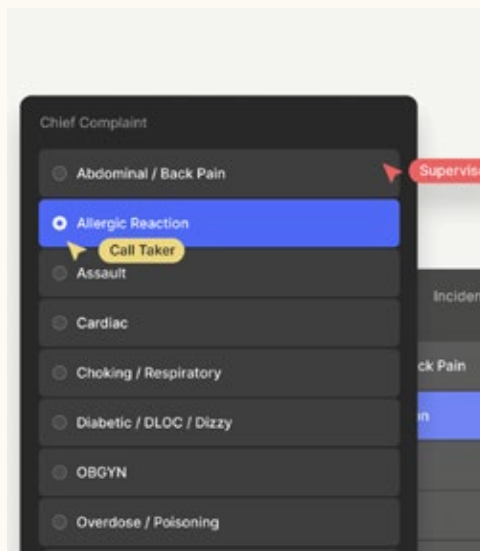
In the broader scope of culture and technology, the application of AI like that of Corti in clinical settings could be perceived through a critical lens to understand the mediating effects such technology brings to clinical encounters.⁹ By offering real-time suggestions and automating administrative processes, Corti AI changes the traditional patient-professional interaction, embodying a form of agency that resonates with postphenomenological discussions on technological mediation.

Mediation

Agency

Ethics

Biopower



Sources

- Crunchbase. "Corti - Crunchbase Company Profile & Funding." Crunchbase, www.crunchbase.com/organization/corti.
- MarketScreener. "Corti.ai: Raises \$27 Million in Series A Funding to Transform Patient...," MarketScreener, www.marketscreener.com/news/latest/Corti-ai-Raises-27-Million-in-Series-A-Funding-to-Transform-Patient-35727063/.
- Corti. "About Corti." Corti, www.corti.ai/about.
- BusinessWire. "Corti.ai Raises \$27 Million in Series A Funding to Transform Patient..." BusinessWire, www.businesswire.com/news/home/20230627005227/en/Corti.ai-Raises-27-Million-in-Series-A-Funding-to-Transform-Patient-Consultations.
- Corti. "Corti Raises \$60M in Series B Funding to Accelerate Healthcare AI..." Corti, www.corti.ai/post/corti-raises-60m-in-series-b-funding-to-accelerate-healthcare-ai-adoption.
- Springer. "Postphenomenological Method and Technological Things Themselves." Springer, link.springer.com/chapter/10.1007/978-3-030-31125-4_3.
- OpenEdition Journals. "The Asymmetrical Relationship Between Humans And Technologies." Journals.openedition.org, journals.openedition.org/estetica/article/view/2932.
- Corti. "Corti - AI for Patient Consultations." Corti, www.corti.ai/.
- Springer. "Rethinking explainability: toward a postphenomenology of..." Springer, link.springer.com/article/10.1007/s13347-020-00403-6.

Case study

Doctrin

Sweden

Doctrin is a Swedish digital health company established with the ambitious goal of advancing healthcare by intelligently digitizing the patient journey. This endeavor is aimed at enhancing patient experiences, refining diagnoses, and optimizing the utilization of medical resources. The overarching aspiration of Doctrin is to improve healthcare for a billion individuals by 2030¹.

Funding Milestones

Doctrin's journey towards realizing its ambitious goals has been bolstered by substantial financial backing. A notable milestone was the procurement of SEK 100 million in a Series A round spearheaded by healthcare provider Capio and Life Science fund HealthCap, with additional participation from Inbox Capital and Norrskan Foundation. This infusion of capital aimed to expedite Doctrin's expansion both within Sweden and internationally, with a particular emphasis on enhancing artificial intelligence within their product suite². Over time, Doctrin has amassed a total of \$43 million in funding across seven rounds, with the latest influx occurring on June 21, 2021, during a Series C round. A diverse array of investors has backed Doctrin's vision, including Capio and Swedbank Robur³.

At the core

The core functionality of Doctrin revolves around the provision of a B2B platform designed to digitalize physical healthcare services. As of now, the platform boasts implementation across nearly 200 healthcare units, engaging more than 6000 healthcare staff and handling a million patient cases annually. About 2.3 million individuals currently have access to Doctrin's platform, indicating a significant stride towards their long-term goal of broad-spectrum healthcare improvement⁴.

Biopower: An Interpretive Lens

The philosophical underpinning of biopower, as extrapolated from postphenomenology, could be mirrored in Doctrin's operational ethos. The narrative of biopower is entwined with the mechanisms by which human life is managed and regulated, especially in the domain of healthcare. Doctrin's digital platform can be seen as a manifestation of biopower, where technology becomes an extension of healthcare provision, thus shaping the doctor-patient interaction.

Doctrin's founder, Magnus Liungman, highlights a patient-centric approach echoing William Osler's sentiment: "Listen to the patient, he is telling you the diagnosis". This ethos reflects a shift towards empowering patients by enhancing their narrative within the healthcare ecosystem. Certainly,

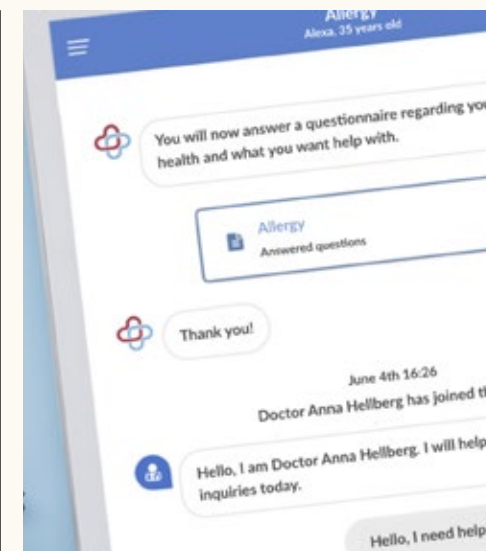
- "Doctrin Secures SEK 13M Investment to Expand its Digital Healthcare Tools." Mynewsdesk, 30 May 2018, www.mynewsdesk.com/se/doctrin/presreleases/doctrin-secures-sek-13m-investment-to-expand-its-digital-healthcare-tools-2509987.
- "Doctrin raises SEK 100 million to further improve healthcare through intelligent digitalisation." Doctrin, 18 Feb 2021, www.doctrin.se/en/news/doctrin-raises-sek-100-million-to-further-improve-healthcare-through-intelligent-digitalisation.

Mediation

Agency

Ethics

Biopower



Sources

- "Doctrin - Funding, Financials, Valuation & Investors." Crunchbase, www.crunchbase.com/organization/doctrin.
- "About Us." Doctrin, www.doctrin.se/en/about-us.
- "Doctrin founder and CEO Magnus Liungman: 'It's Easy to Focus Too Much on the Tech Aspect of Healthcare' — Red Herring." Red Herring, www.redherring.com/health/doctrin-founder-and-ceo-magnus-liungman-its-easy-to-focus-too-much-on-the-tech-aspect-of-healthtech.



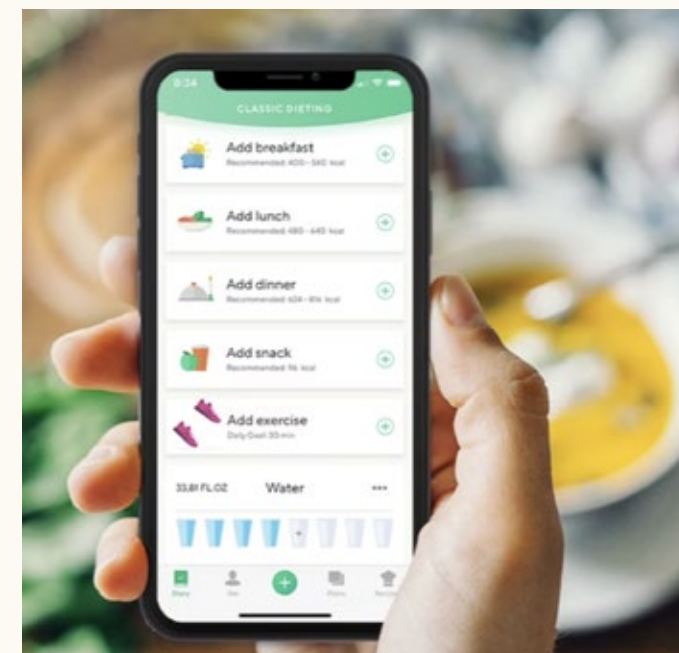
EDGE CASES

Particularly innovative features in Nordic health tech services or operating in Nordic markets

feature	Company and region	Description
AI-Powered Mental Health Chatbots	Wysa, India (operates globally, also in Nordic countries)	AI-powered chatbots for mental health support and counseling. The chatbot s mediate the interaction between users and mental health support, altering the traditional counseling dynamics.
Personalized Nutrition Planning	Lifesum, Sweden	Personalized meal planning based on dietary preferences, health goals, and allergies. The platform accommodates individual dietary needs and preferences, respecting the alterity of users.
Remote Health Monitoring with Wearables	Withings (part of Nokia Health, Finland/France)	Wearable devices for remote monitoring of vital health parameters. Wearables incorporate health monitoring into daily life, altering the way individuals engage with their health.
Tele-Rehabilitation Programs	DigiRehab, Sweden	Tele-rehabilitation programs for remote access to physical therapy and exercise routines. Tele-rehabilitation extends access to healthcare services, transcending geographical boundaries.
Personalized Digital Physiotherapist	Kaia Health, Germany (expressive presence in Nordic countries)	AI-powered digital physiotherapy guidance with real-time feedback. The digital physiotherapist optimizes exercise routines through real-time feedback, altering the traditional physiotherapy process.
AI-Powered Symptom Checker	KRY (Livi in some regions, Sweden)	AI-driven symptom checker for remote medical assessment. The AI symptom checker reduces the need for in-person medical assessments, changing how healthcare consultations occur.
Virtual Reality Pain Management	Mimerse, Sweden	Virtual reality-based pain management for various medical conditions. Virtual reality acts as embodiment, altering the embodied experience of pain management.
Smart Inhalers with Adherence Tracking	Cohero Health, Sweden (with a presence in the U.S.)	Smart inhalers with adherence tracking to improve asthma management. Smart inhalers hybridize inhalation therapy with data tracking, transforming asthma care.
Digital Health Records with Blockchain Security	Digi.me, United Kingdom (with global presence)	Digital health records secured with blockchain technology Blockchain security offers immediate access and control over personal health data
Elderly Care Monitoring with IoT Sensors	Cuviva, Sweden	Elderly care monitoring using IoT sensors for safety and well-being. IoT sensors create a ubiquitous monitoring network, altering elderly care practices.



Withings: an ecosystem of remote devices for vital health monitoring.



Lifesum: users track food, know their caloric intake and receive nutritional tips. The bigger opportunity, however, is in partnering with health professionals.

Telemedicine and biopower

A critical inquiry

The reconfiguration of the patient-doctor relationship through digital platforms like Doctrin's can be critically examined through lens of biopower. Biopower refers to the regulation of populations by institutions and the various ways in which modern societies regulate individuals and groups. It involves an entanglement of the knowledge/power nexus, where knowledge production is intertwined with power relations.

In the traditional face-to-face patient-doctor interactions, there's a specific kind of knowledge exchange and power dynamic that unfolds. The physician, through years of training, embodies a form of medical authority, while the patient embodies experiential knowledge of their own body. This dynamic is rich with nuance, subjectivity, and interpersonal relations, which can both aid and hinder the diagnostic and therapeutic process.

Enter Doctrin, with a platform designed to digitize and streamline the healthcare process. Through its digital tools, Doctrin endeavors to make the patient-doctor interaction more efficient, reducing administrative burden and potentially leading to better healthcare outcomes⁵. Here, we see a shift in how medical knowledge is produced, accessed, and utilized. The digitization seeks to mitigate the 'mistakes, relations, conceptions and misconceptions' inherent in face-to-face interactions, by standardizing the process of medical consultation.

A new relationship

The reconfiguration of the patient-doctor interaction through digital means can also impact the agency and autonomy of both patients and doctors. It alters the

trust dynamics, the decision-making processes, and the overall experience of healthcare. If people are healthier, health is more democratized, and more lives are saved, losing face to face contact may be, after all, a good thing worth being nostalgic about — but allowing it to be part of the past.

In the same way that we lost connections at our video store or with bank tellers due to automation and digitalization, the change to telehealth may be an important step to take concerning the entire practice of medicine, of what it means to be a doctor and what it means to be a patient.

This is not to say the “analogical doctor-patient” relation is better, but rather to understand that a significant practice change may take place, and we should prepare for it and mitigate its transformational pains.

Bodies or data streams?

The process of converting patients' symptoms and experiences into structured digital data represents a form of “datafication”. This datafication can be empowering but also dehumanizing. It allows for the collection, analysis, and use of health data in ways that can significantly impact individuals' lives and health outcomes. Moreover, it raises questions about who owns, controls, and has access to this data. With ostensive datafication of bodies, comes the responsibility of data security and the potential access and commodification of such databases. The commercial use of those databases are never sudden. Rather, they are pervasive: suffice to say how little we know about the way our personal data is processed, commercialized and inserted into the marketing

ecosystem of the web. The notion that our genetic or health records, compiled in unimaginable details, can be used for “good” commercial use is a treacherous one, and we are starting to have enough benefits of this datafication that the risks, outweighed, need to be discussed.

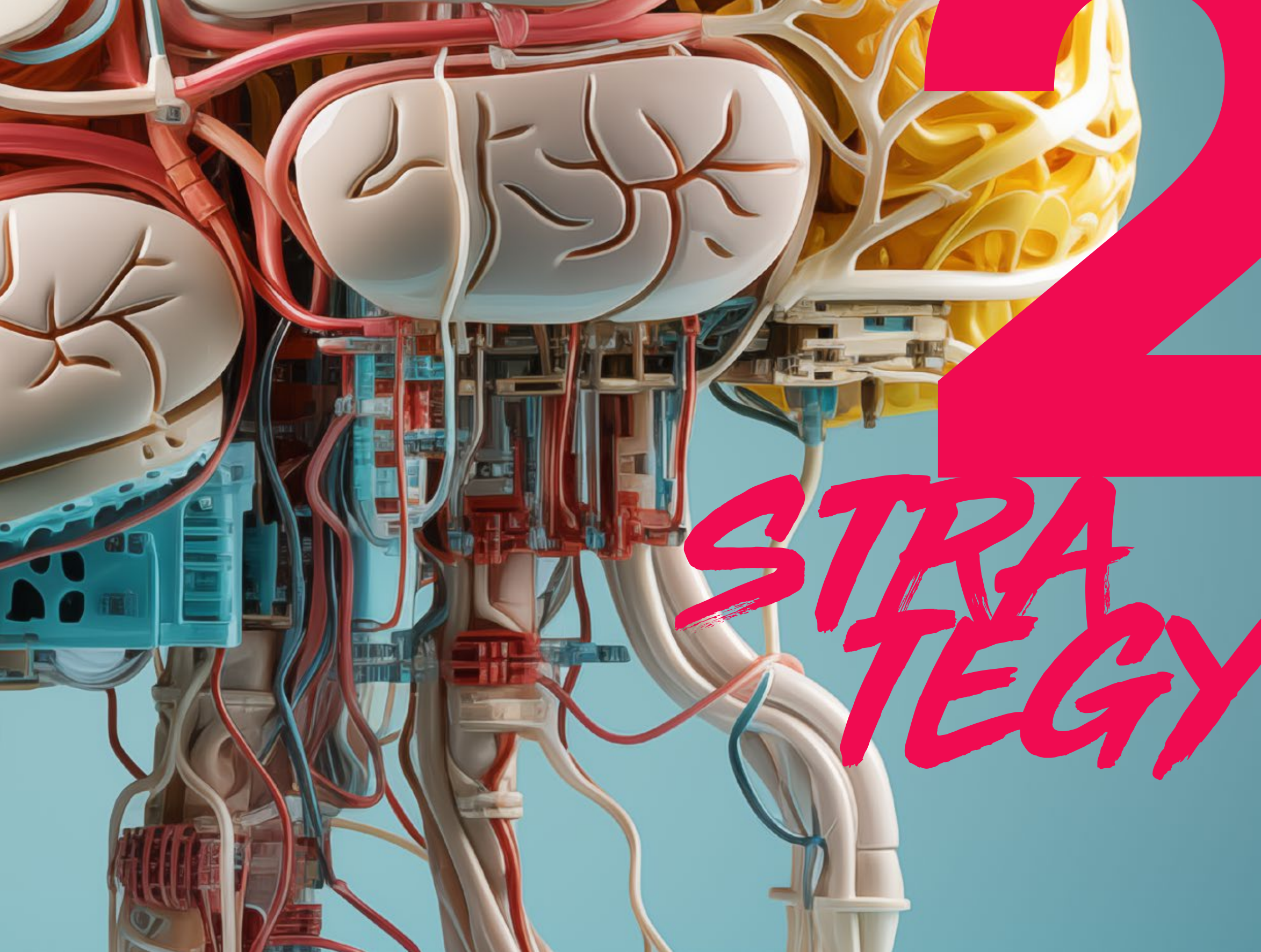
The manifestation of biopower through digital healthcare platforms is a multi-dimensional phenomenon that intersects with broader societal, ethical, and political concerns. It reflects a broader shift in the governance of health and bodies, marking a significant chapter in the narrative of biopower in the digital age. While the focus of some of these companies is right — they focus on back-end streamlining — the push for “faster doctor consultations” is a common driver in this line of business, and conveniently aligned with the idea of telemedicine. While the benefits of remote appointments are clear, as a rule of thumb, it is important to keep track of the new problems that arise with new technological solutions — especially when it comes to health, and especially when it deals with intricate questions that can be left out of the



data measurements: the unattended population, the desensitized relations, the unseen problems and, moreover, misdiagnoses.

Sources

1. "Doctrin Secures SEK 13M Investment to Expand its Digital Healthcare Tools." Mynewsdesk, 30 May 2018, www.mynewsdesk.com/se/doctrin/pressreleases/doctrin-secures-sek-13m-investment-to-expand-its-digital-healthcare-tools-2509987.
2. "Doctrin raises SEK 100 million to further improve healthcare through intelligent digitalisation." Doctrin, 18 Feb 2021, www.doctrin.se/en/news/doctrin-raises-sek-100-million-to-further-improve-healthcare-through-intelligent-digitalisation.
3. "Doctrin - Funding, Financials, Valuation & Investors." Crunchbase, www.crunchbase.com/organization/doctrin.
4. "About Us." Doctrin, www.doctrin.se/en/about-us.
5. "Doctrin founder and CEO Magnus Liungman: 'It's Easy to Focus Too Much on the Tech Aspect of Healthtech' — Red Herring." Red Herring, www.redherring.com/health/doctrin-founder-and-ceo-magnus-liungman-its-easy-to-focus-too-much-on-the-tech-aspect-of-healthtech.



STRATEGY

Nordic cultures: A history with health and nature



The Nordic countries have long held a profound respect for nature and its healing properties.

Traditional health practices were deeply rooted in natural remedies, with herbs, plants, and the clean Nordic environment playing pivotal roles in well-being. Saunas in Finland, for instance, weren't merely a place for relaxation but were seen as crucial for mental and physical health. This intrinsic connection between the environment and health laid the foundation for a comprehensive understanding of well-being that went beyond just medicine.

Ancient Health Practices

The Nordics have a rich ethnobotanical tradition where specific flora, such as *Angelica archangelica* in Iceland, were employed for medicinal purposes. These practices were meticulously documented in early pharmacopeias, reflecting the region's pragmatic approach to health. From the Sami people's reliance on *Rhodiola rosea* to combat fatigue to the widespread use of birch sap in spring tonics, indigenous knowledge formed the backbone of early Nordic health systems.

State-Driven Health Reforms of the 20th Century

The 20th century saw the Nordics undergo substantial health reforms, driven by state initiatives. Sweden's 1962 Medical Care Act, for instance, aimed to offer equal healthcare access, reflecting the region's socio-political ethos. Finland's emphasis on public health, initiated in the 1970s, led to dramatic reductions in coronary heart disease mortality, showcasing the effectiveness of state-driven interventions in shaping health outcomes.

Nordic Digital Leap: Pioneering E-Health Initiatives

By the late 20th century, the Nordics recognized the potential of digitizing health services. Estonia, often considered part of the Nordic-Baltic collaboration, became a trailblazer with its e-health system initiated in 2008. It wasn't just about digitization but the creation of interoperable systems, where data exchange was crucial. Sweden's 'Journalen' system allowed patients access to their electronic health records, indicating a shift towards transparency and patient empowerment.

Precision Medicine and Genomic Endeavors

The Nordics have been at the forefront of genomic research, leveraging their homogeneous populations for precision medicine. Projects like deCODE genetics in Iceland aimed to analyze the unique genetic makeup of its population to derive insights into various diseases. This data-driven approach to health, rooted in genetic research, epitomizes the region's commitment to marrying technological advancements with healthcare objectives.

Contemporary Landscape: AI's Integration in Clinical Practice

Today, the Nordics are leveraging artificial intelligence in clinical settings with a precision unmatched by many. Denmark's deployment of AI in radiology, to detect early signs of diseases like cancer, is a testament to the region's forward-thinking approach. Simultaneously, Finland's national AI program showcases the country's strategic intent to position itself as a global leader in AI-driven health solutions.

Diving into the Nordics' health and technology evolution, it's evident that their progress isn't mere happenstance. It's a calculated trajectory rooted in historical practices, state-driven initiatives, and an unwavering commitment to pioneering global health innovations.

Sources

<https://www.decode.com/>
<https://hms.harvard.edu/news/ai-predicts-future-pancreatic-cancer>
<https://vm.fi/en/national-artificial-intelligence-programme-auroraai>

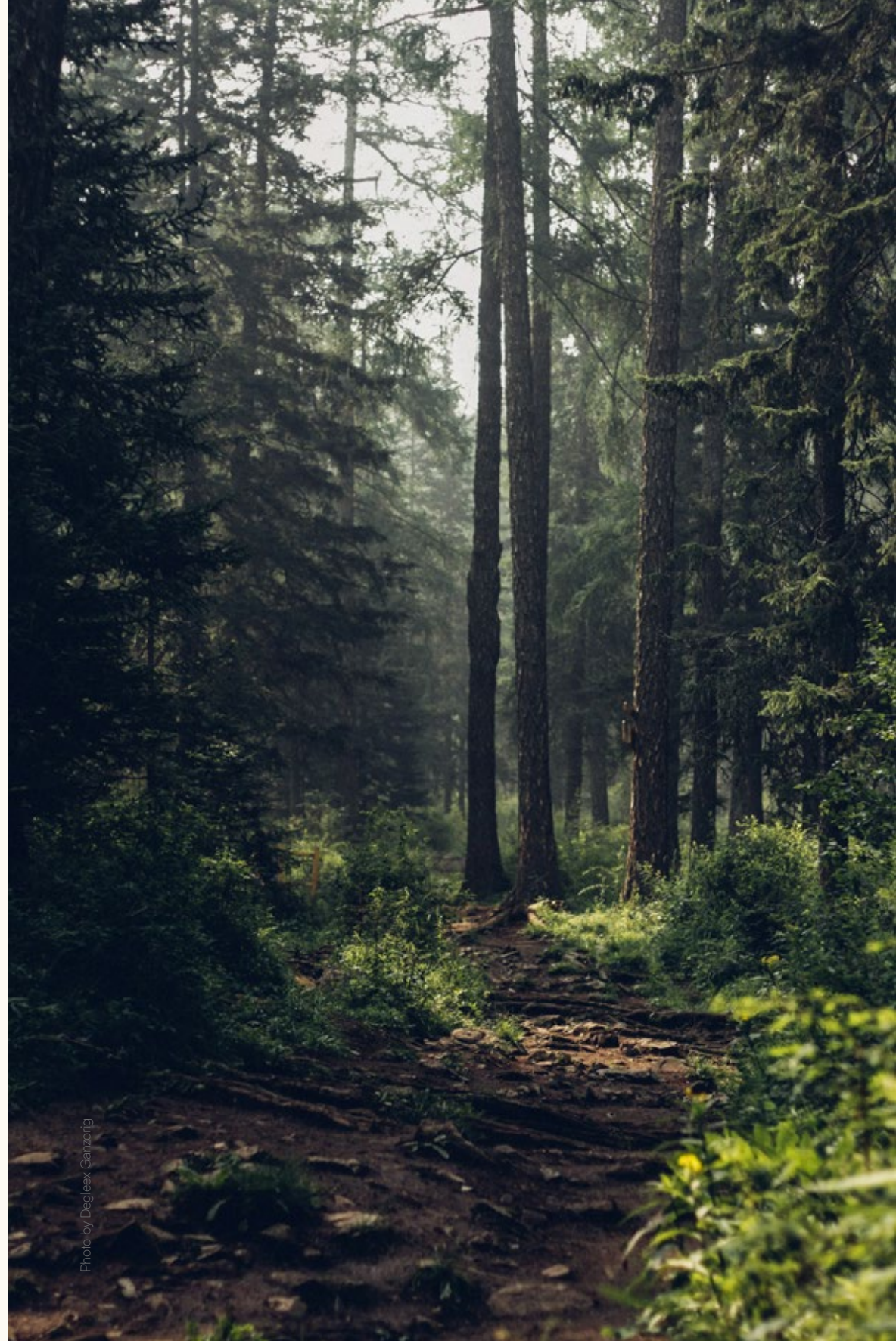


Photo by Dagtelex Ganzorig

Strategic analysis

This chapter dives into an analysis on the interplay of experience, technology, and health in the Nordics

Ecosystems

First, we explore the social ecosystems, the interconnected web of social relationships, cultural norms, and communal behaviors that shape how technologies are perceived and adopted in society.

Then we dive into the business ecosystem, understanding companies, suppliers, and other entities that interact within the health tech industry, driving innovation and market dynamics.



The market

In this simple market overview, we present a detailed snapshot of the current market state and project the Compound Annual Growth Rate (CAGR) for the upcoming decade, offering insights into potential growth and expansion avenues.

CAGR, for the uninitiated, represents the geometric progression ratio that offers a constant rate of return over a time period.

Culture-Market Intersect Matrix

We then present a matrix of intersection between market investment and cultural openness. Differently from popular interest, this matrix indicates convergence between consolidated popular interest (a proxy for market growth) and cultural values openness to technological experiences.

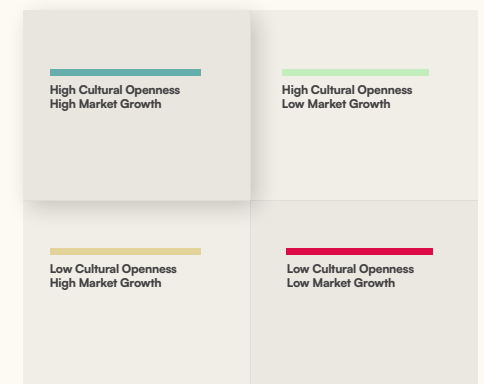


Drivers and signals

The chapter also dissects business drivers — primary market forces, be they technological advancements, policy changes, or societal shifts, that propel the industry forward. Complementing this are cultural signals, which are early indicators or trends hinting at potential future trajectories of the market.

Takeaways for the present-future

We now provide actionable insights that a number of companies and stakeholders can focus right now, which point to the direction to which markets and culture is going. This allows readers to react in a timely manner, while still maintaining an accurate long term direction of what is most likely to be the future.



Social ecosystem

Interactions, relationships, and institutions

Public Sector & Regulatory Bodies

Government Health Departments

They set health policies, provide funding, and oversee the public health system.

Regulatory Authorities

Bodies that ensure the safety, efficacy, and security of health technologies and digital platforms.

Public Health Institutions

Hospitals, clinics, and other facilities that might implement or benefit from health technologies.



Minister for Social Affairs and Public Health Jakob Forssmed.
Photo: Johannes Frandsen/Government offices

Research & Academia

Universities & Research Institutions

Driving innovation through research on health tech, AI in medicine, and more.

Think Tanks

Organizations that study the implications, challenges, and potential of health technologies

Media & Information Disseminators

Tech Journalists & Bloggers

They play a role in educating the public about new health tech innovations.

Health & Wellness Influencers

Especially in the age of social media, they can influence public perception and adoption of health technologies.

Civil Society & Non-Governmental Organizations (NGOs)

Patient Advocacy Groups

Representing the needs and concerns of patients.

Digital Rights & Privacy Groups

Ensuring that the adoption of health tech respects privacy rights and data protection.

Community Health NGOs

They might play a role in the grassroots implementation of health technologies, especially in remote or underserved areas. engagement with information technologies.



Thordis Elva, Chair at Nordic Digital Rights and Equality Foundation

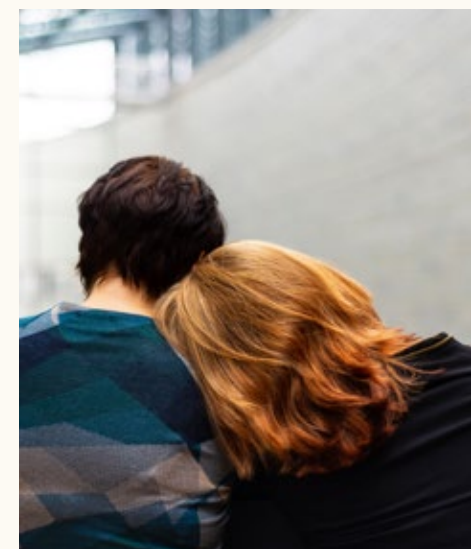


Photo by Transly Translation Agency

End-Users & Beneficiaries

Patients

The ultimate beneficiaries of health technologies.

Healthcare Professionals

Doctors, nurses, therapists, and other professionals who would use or interact with health tech solutions.

General Public

As potential users of preventive health technologies, fitness apps, wearables, etc.

Business ecosystem

The economical web

Start-ups & Health Tech Companies

HealthTech Platforms

Companies developing apps or platforms for telemedicine, patient monitoring, health data analysis, etc.

Medical Device Manufacturers

Firms specializing in wearable health tech, diagnostic devices, and other health-related hardware.

Biotech Firms

Companies at the intersection of biology and technology, working on personalized medicine, genomic research, and more.

Getting started

- Diffia
- Dr.Dropin
- Finnadvance
- APLEX Bio
- LS CancerDiag
- KAMU Health
- Cardiolyse
- Kry



Soheil Dabestani, CEO at Diffia

Patterns identified

- Partnerships and Collaborations
- Customer-Centric Approach
- Employee welfare

Established Healthcare Corporations

Pharmaceutical Companies

Many are now collaborating with tech firms for drug research, patient monitoring, or using AI for drug discovery.

Healthcare Service Providers

Private hospitals, clinics, and care facilities that are integrating technology into their service delivery.

Getting started

- Novo Nordisk
- Orion Corporation
- Getinge
- Elekta
- Coloplast
- GN Store Nord
- Ambu
- Foss Analytics
- Lundbeck
- Arjo



Lars Fruergaard Jørgensen, CEO of Novo Nordisk. Photo by Jesper Westley

Patterns identified

- AI and Cloud-computing utilization
- International target markets
- Investor confidence and significant funding raised

Incubators and accelerators

Health Tech Incubators: Provide mentoring, office space, and sometimes initial seed funding to health tech start-ups.

Accelerators: Offer growth-driven programs, often with funding, to help scale-up promising start-ups in the health tech domain.

Getting started

- Health Incubator Helsinki
- Fast Track Malmö
- Health2B
- Terkko
- Vertical
- Nordic Innovation Accelerator (NIA)
- Maria 013

Research and consulting

Research & Analytics Firms

Provide market research, trends, and forecasts specific to the health tech sector.

Business Consulting Firms

Offer strategic guidance to health tech companies on market positioning, expansion, mergers, and more.

Getting started

- Tesi (Finnish Industry Investment Ltd)
- TEM Foundation
- QuintilesIMS (now IQVIA)
- McKinsey & Company
- ZS Associates
- Accenture
- Deloitte
- Nordic Consulting, Inc.
- Capgemini

Investors

Venture Capitalists (VCs)

Investment firms that provide capital to start-ups with high growth potential in the health tech space.

Angel Investors

High-net-worth individuals who provide capital for a business start-up, usually in exchange for convertible debt or ownership equity.

Private Equity Firms

Investors that directly invest in private companies or engage in buyouts of public companies.

Healthcare-specific Investment Firms

VCs or private equity firms with a specific focus on the healthcare and health tech sector.

Getting started

- Almi Invest
- HealthCap
- Industrifonden
- Nordic Makers
- Inventure
- Creandum
- Northzone
- Accel
- Kurma Partners
- MVM Partners



Anna Ljungdahl, Senior Investment Director at Industrifonden

Patterns identified

- AI and Cloud-computing utilization
- International target markets
- Investor confidence and significant funding raised

Financial institutions

Banks

Provide loans, credit facilities, and other financial services to businesses in the health tech sector.

Impact Investment Firms

Focus on investments that generate a measurable, beneficial social or environmental impact alongside a financial return, especially relevant if the health tech solution addresses broader societal challenges.

Getting started

Nordic Capital

Eir Ventures

Saminvest

European Investment

Fund (EIF)

Vækstfonden

Novo Holdings



Sources for Business Ecosystem

"CB Insights." CB Insights. www.cbinsights.com.

"MSC Nordics." MSC Nordics. www.msccapital.com.

"Sifted." Sifted. www.sifted.eu.

"Open Access Government." Open Access Government. www.openaccessgovernment.org.

"TechMonitor." TechMonitor. www.techmonitor.ai.

"Europe's Top 14 Healthtech Startup Accelerators & Incubators [2023]." Sharp Sheets. sharpsheets.io/blog/europe-healthtech-startup-accelerators-incubators.

Çelik, SKagan. "Startup Ecosystem, Incubators and Accelerators in Finland." Medium. medium.com/@SKaganCelik/startup-ecosystem-incubators-and-accelerators-in-finland-507ddd50f341.

"Health Incubator Helsinki." Health Incubator Helsinki. healthincubatorhelsinki.com.

"Best Startup Accelerators and Incubators for Healthtech in Europe." Speed Invest. www.speedinvest.com/blog/best-startup-accelerators-and-incubators-for-healthtech-in-europe.

"Health Tech Accelerators and Incubators in Europe — Top 10." Kolabtree. www.kolabtree.com/blog/health-tech-accelerators-and-incubators-in-europe-top-10.

"Healthcare | Nordic Capital." Nordic Capital. www.nordiccapital.com/our-approach/sectors/healthcare.

"New Nordic Life Science Venture Fund, Eir Ventures, Launched to Leverage the Untapped Potential of Health Care Innovation." Eir Ventures. eirventures.eu/new-nordic-life-science-venture-fund-eir-ventures-launched-to-leverage-the-untapped-potential-of-health-care-innovation.

of-health-care-innovation.

"Top Investment Banks in the Healthcare Industry." Investopedia. www.investopedia.com/articles/investing/092315/top-investment-banks-healthcare-industry.asp.

"New Nordic Life Science Venture Fund, Eir Ventures, Launched to Leverage the Untapped Potential of Health Care Innovation." PR Newswire. www.prnewswire.com/news-releases/new-nordic-life-science-venture-fund-eir-ventures-launched-to-leverage-the-untapped-potential-of-health-care-innovation-301091065.html.

"Sustainability in Healthcare: The Nordic Experience." Open Access Government. www.openaccessgovernment.org/sustainability-in-healthcare-the-nordic-experience/140627.

"The Best Consulting Firms for Healthcare, Pharma and Life Sciences." Consultancy.uk. www.consultancy.uk/news/17157/the-best-consulting-firms-for-healthcare-pharma-and-life-sciences.

"Home | Nordic Consulting, Inc. | Global Health and Technology Consulting." Nordic Consulting. www.nordicglobal.com.

Drivers

Factors propelling business activities and decisions



Artificial Intelligence adoption curve

AI is set to radically reshape the way companies do business². It's not only an automation play; it's also an augmentation and enhancement play². AI can provide predictions at a scale and depth of detail impossible for individuals².



Innovation in Environmental, Social and Governance

Innovative procurement techniques are being used for environmental performance and management structures for sustainability across all departments⁴.



Data maturity and higher utilization

Many organizations are shaping their activities and business models around AI and data, which will, in many cases, become a key strategic asset². Structuring data and amplifying collection is in the pipeline.



Cross-boundary innovation

There's a focus on cross-boundary innovation and fostering collaboration through partnerships⁴. Remote collaboration is not enough: transdisciplinarity, where teams learn from one another, fosters upskilling and better collaboration.

Business at the speed of data

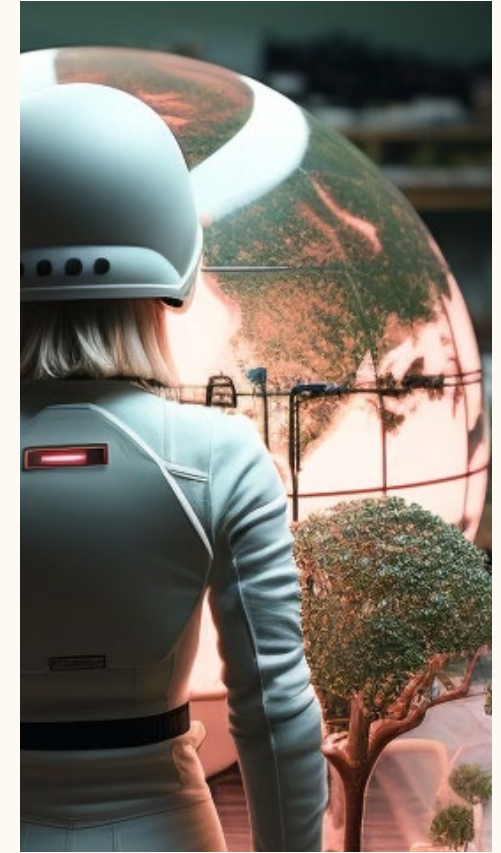
The business environment demands immediate adaptation and response to new market opportunities and changing regulations³. The need for speed in data exchange comes also from solutions built for 5G and edge computing.

Aging population

The healthcare needs of an aging population are another major driver. This is attracting a growing number of generalist and specialist investors to invest in the field¹

A globally competitive market

A far more competitive, consumer-driven market that requires new strategies for attracting and retaining customers³, partners and collaboration alike. Strategies for crossing borders should be considered both in collaboration and in business offering.



Smart and sustainable hospital buildings

The focus on sustainable hospital buildings is another driver in the healthcare sector⁴. Smart hospitals are among the most complex and growing environments within the ecosystem of health and technology.

Sources for Drivers

Accessed by Bing, 13/10/2023

(1) Investor approaches and perspectives in Nordic Health Tech. <https://www.norden.org/en/publication/investor-approaches-and-perspectives-nordic-health-tech>.

(2) Nordic AI: Transforming businesses | McKinsey. <https://www.mckinsey.com/featured-insights/artificial-intelligence/how-artificial-intelligence-will-transform-nordic-businesses>.

(3) Sustainability in healthcare: The Nordic experience. <https://www.openaccessgovernment.org/sustainability-in-healthcare-the-nordic-experience/140627/>.

(4) Key Business Drivers and Competencies For Post-Reform Healthcare ... - Pega. <https://www.pegacom/insights/resources/key-business-drivers-and-competencies-post-reform-healthcare-transformation>.

(5) NORDIC HEALTHCARE SECTORS ARE CHALLENGED. https://www.sas.com/content/dam/SAS/bp_nordic/doc/other/nordic-healthcare-sectors-are-challenged.pdf.

Signals

Indicators for new beliefs, values, and norms



Efficient and sustainable healthcare

The Nordic countries are at the forefront of sustainability in healthcare¹. They have managed to build resilient and efficient healthcare systems with a positive sustainability performance compared to most other countries¹. This is a strong cultural signal that points towards a future where sustainability is a key aspect of healthcare.

Preventive Health

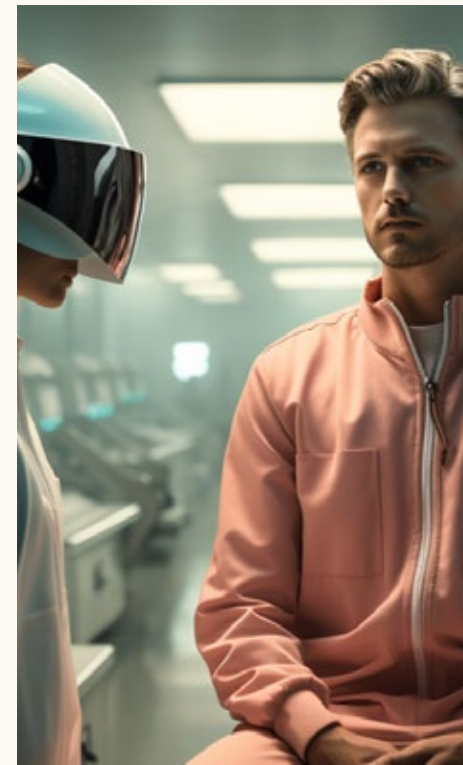
There is a shift from sick care to preventive health to ensure the longevity of healthcare systems and improved quality of life². The Nordic Health 2030 Movement is driving this transition by connecting and activating people across the Nordics to work towards sustainable solutions, inclusive partnerships, and holistic thinking around health².

* Internodes



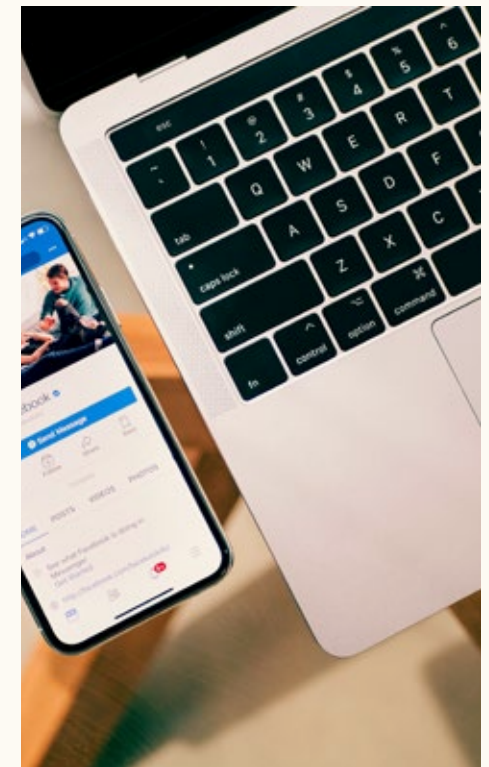
“We gathered culture-sensitive experts to discuss what they see, everyday, in health and technology. The synergy was amazing. When people are prompt to talk about what they know, without too complex structures, they can exchange so much. That’s a way to make transdisciplinarity to happen.”

Jane Vita, Design Lead at Zurich Group Insurances



Patient education

In the age of Covid-19, people are increasingly turning to social media to get information from healthcare sources they trust in “micro-moments” that are palatable for our overstressed brains⁵.



Health conversations in social media

Healthcare organizations are using social media to inform their audiences and combat misinformation because it’s the easiest and most effective way to reach large numbers of people quickly⁵. This trend is likely to continue as more people turn to social media for health information.

Social media: support and empowerment

Patients now have hands-on access to information about diseases, conditions, and illnesses through social media⁵. This presents an opportunity for them not to feel alone and to be empowered to take charge of their health.



Generative AI for healthcare

Generative AI will be particularly impactful over the next few years. It will democratize access to other transformative AI applications, making it easier to implement and interpret results and generate personalized recommendations⁴.that cater to mental HealthTech.



Wider adoption of digital technology

Healthcare organizations are combining the power of technology and human ingenuity to improve digital adoption¹⁰.

Lifestyle issues

There is growing concern about 'lifestyle' issues which has prompted increased interest in preventative policies including reducing use of tobacco, alcohol, narcotics, improving diet and exercise, coping with 'new' contagious diseases (e.g. STDs), and providing suitable care for the growing elderly population⁹.

(Digital) Health Standards

The Nordic HealthTech and Evaluation Criteria (NordDEC) programme aims to enable healthcare providers across Sweden, Denmark, Norway, Finland, and Iceland to evaluate and identify trusted HealthTech technologies within healthcare and preventive care³.

Sources for Signals

- (1) Sustainability in healthcare: The Nordic experience. <https://www.openaccessgovernment.org/sustainability-in-healthcare-the-nordic-experience/140627/>.
- (2) Nordic Health 2030 - Nordic Co-operation. <https://www.norden.org/en/publication/nordic-health-2030>.
- (3) Cross-border system launched to unify HealthTech standards in the <https://www.healthcareitnews.com/news/emea/cross-border-system-launched-unify-digital-health-standards-nordics>.
- (4) Healthcare Social Media Trends To Watch In 2022 - Forbes. <https://www.forbes.com/sites/forbesbusinesscouncil/2022/01/24/healthcare-social-media-trends-to-watch-in-2022/>.
- (5) Healthcare in the Nordics. <https://nordics.info/show/artikel/healthcare-in-the-nordic-region/>.
- (6) Digital Technology Adoption in Healthcare | Accenture. <https://www.accenture.com/us-en/insights/health/digital-adoption-healthcare-reaction-or-revolution>.
- (7) The 10 Biggest Trends Revolutionizing Healthcare In 2024 - Forbes. <https://www.forbes.com/sites/bernardmarr/2023/10/03/the-10-biggest-trends-revolutionizing-healthcare-in-2024/>.
- (8) Four big digital trends set to impact pharma marketers in 2023. <https://econsultancy.com/digital-trends-pharma-marketing-2023/>.
- (9) Social Media in Healthcare: Benefits and Opportunities. <https://healthcaremba.gwu.edu/blog/social-media-in-healthcare>.
- (10) The 26 Best Topics in Healthcare Content Marketing - Convince & Convert. <https://www.convinceandconvert.com/content-marketing/26-best-topics-in-healthcare-content-marketing/>.

An innovative methodology has been employed to gather insights into the intersections of health, technology, and culture. This exploration unveils the role of culture-sensitive experts. These professionals, entrenched in the nexus of healthcare and technology, were invited to contribute with signals from their respective fields.

To facilitate structured yet open dialogues for a deeper exploration of these cultural signals, scholars adopted the renowned "fishbowl" format. Originating from the realm of group dynamics and participatory discourse, the fishbowl method convenes experts and participants in a structured conversational environment.

This format fosters active listening, thoughtful reflection, and the exchange of diverse viewpoints—an ideal platform for dissecting the intricate tapestry of health, technology, and culture.

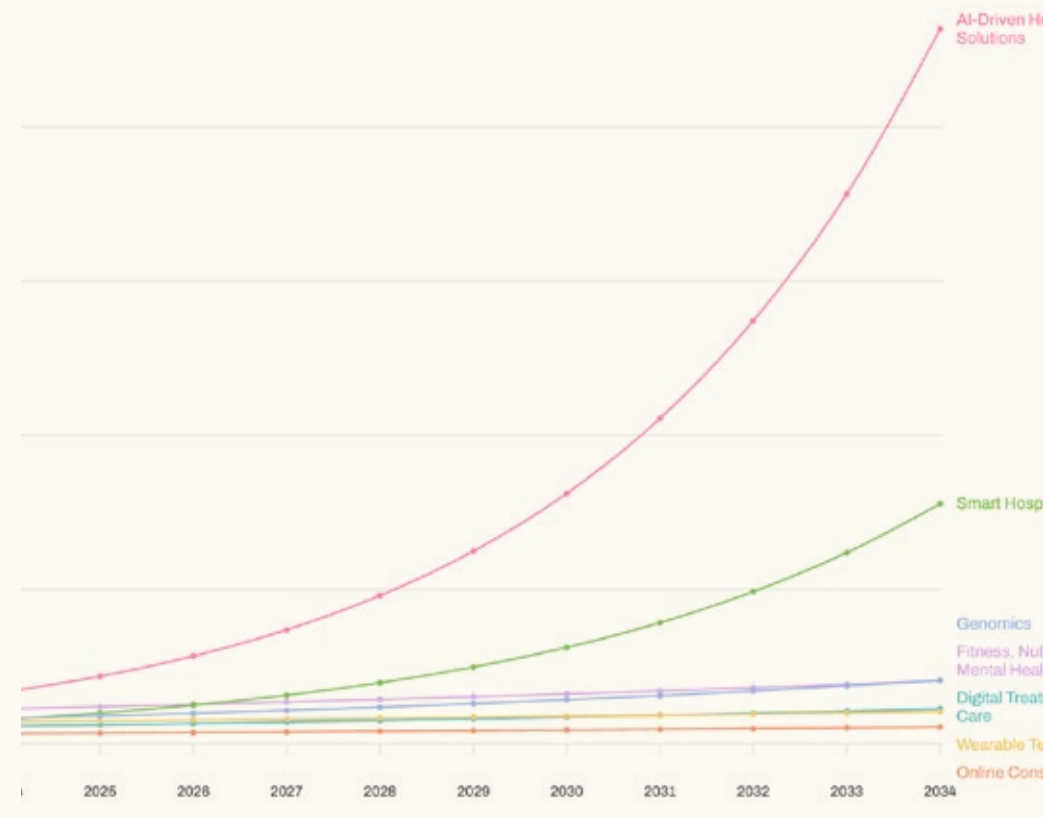
The event and fishbowl discussion were directed by researchers Jana Pejsoška and Jane Vita, from Aalto University, adding scholarly rigor to the process.

Culture-Sensitive Experts and the Fishbowl

Market overview

Health and technology market overview in the Nordics, 2024-2034

Sector	Market Size Est, in \$ billion, 2024	CAGR% 2024-34	Market Size Est, in \$ billion, 2034
Digital treatment & care ¹	0.571	7.08%	1.13
Wearable Tech ²	0.711	3.84%	1.04
Online consultation ³	0.328	5.14%	0.54
Fitness, Nutrition & Mental health apps ⁴	1.13	6.1%	2.04
Smart hospitals ⁵	0.79	25.68%	7.74
Genomics ⁶	0.82	9.6%	2.06
AI-driven Health Solutions ⁵	1.68	30%	10.57



Health and technology market size growth in the Nordics from 2024—2034, according to estimated CAGR.

Technology not only advancing science, but reshaping health operations and management

While Genomics plays a significant role in science and consumer interest, the most striking aspect of these projections for the Nordic HealthTech sector is the exponential growth anticipated in Smart Hospitals and AI-Driven Health Solutions. These figures underscore the significant impact that advanced technologies are expected to have in revolutionizing healthcare systems, vastly outpacing other subsectors. This suggests a future in which technology not only supplements but dramatically reshapes healthcare delivery, management, workplaces and impact on the population’s lives.

⚠ The larger picture

Disruptive Growth Areas



Smart Hospitals

With a CAGR of 25.68% and a projected market size of \$7.74 billion by 2034, this is the most volatile and potentially rewarding sector.

Innovators could focus on IoT devices, 5G, edge computing and AI algorithms for diagnostics. Possible partners are hyperscalers (AWS, Google, Microsoft), connectivity (Telenor, Telia, Elisa) and Life Science manufacturers (Roche, Siemens etc).



AI-driven Health Solutions

A staggering CAGR of 30% and a projected market size of \$10.57 billion indicates a massive potential.

Strategists could look into partnerships for data sharing, while designers can work on human-AI interaction services and interfaces.



Steady Growth Areas



Digital Treatment & Care

With a moderate CAGR of 7.08%, this sector could be a bedrock for long-term investments.

Designers could look into telehealth UI/UX, and strategists could explore integrating digital treatment (remote calls, self-report, videos, diaries, monitoring) into traditional healthcare models as a full-fledged service and not an “alternative” to in-person treatment.



Genomics

With a CAGR of 9.6%, this is a promising field.

Strategists could explore partnerships with research institutions, while designers might focus on data visualization tools for genetic information. While genomics pertain to research, DNA tests are household products and their utilization is still underused.



Emerging Sectors



Fitness, Nutrition & Mental Health Apps

A market size of \$2.04 billion by 2034 shows that well-being is becoming a lucrative market.

Innovators might look into the gamification of health, developing wearables that integrate with apps, chatbots or loyalty and cashback systems.



Online Consultation Wearable Tech

These sectors have lower but stable growth.

Strategists could look at marketplace partnerships into existing platforms, as well as facilitate partnerships between manufacturers and other agents in the health ecosystem.



Underlying Themes



Holistic Health

There is a clear move towards integrated solutions that cover various aspects of health.

Innovators and strategists could focus on platforms that offer 'Health as a Service', combining various sectors like genomics, AI, and fitness into one agnostic ecosystem, plugged to different providers.

Data-Centric Healthcare

Across all sectors, the importance of data is undeniable.

Design data governance frameworks and ethical AI solutions are in need, to ease fears AI misuse. The time is ripe for mitigating fears and setting guardrails.

User Experience

As healthcare becomes more digital, the user experience will become a differentiator.

Designers could focus on making platforms more intuitive and accessible. B2B and B2C experiences seamless and delightful.

* Internodes

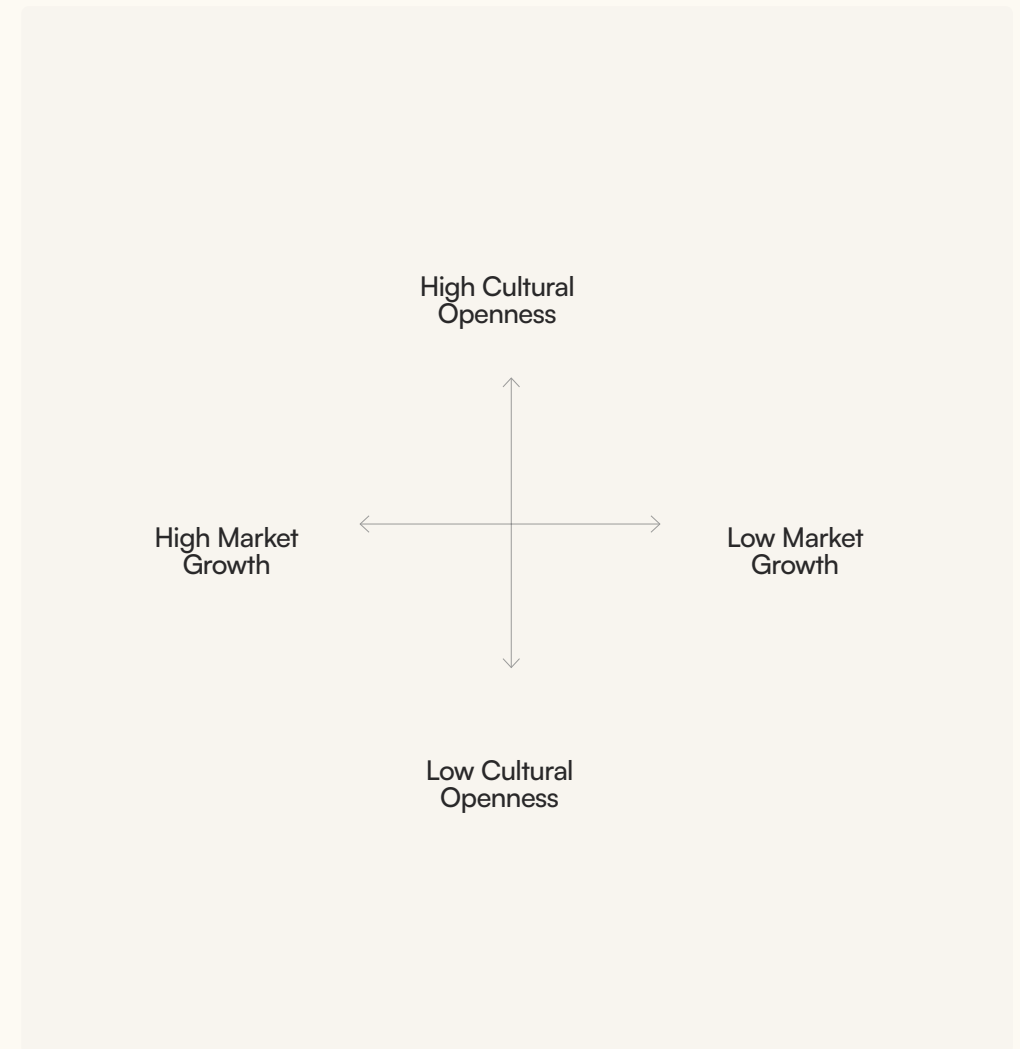


Culture-Market Intersection Matrix (CMIM)

Four quadrants to understand market growth and cultural readiness for technological experiences

The Culture-market Intersection Matrix (CMIM) serves as a strategic tool for businesses aiming to navigate the complexities of emerging markets and evolving consumer preferences. It synthesizes market growth projections with cultural openness to technology, providing a nuanced landscape where business opportunities can be identified and assessed. By aligning these two critical dimensions, the CMIM allows companies to pinpoint where market potential and consumer readiness intersect, thereby enabling more informed, effective, and culturally attuned decision-making. It's not merely a navigational aid, but a lens through which businesses can envision and execute sustainable growth strategies.

Overlapping cultural openness and market growth indicates where investments are going, and where there is ease and friction when it comes to desirability: how willing are people to accept technology in that sphere of their lives?



Vertical Axis: Cultural Openness

This axis will represent the level of acceptance, enthusiasm, or resistance that people have towards technology in each of the technological criteria



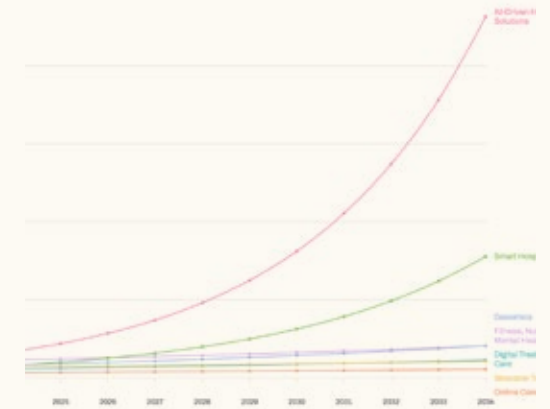
Horizontal Axis: Market Growth

This axis will represent the level of acceptance, enthusiasm, or resistance that people have towards technology in each of the technological criteria



- Caution areas
- Cultural concerns
- Niche potential
- Active market

This overlay enables a nuanced strategy roadmap that acknowledges both human experience and market viability, with four clear strategic needs to consider.



Data on Nordics, cultural openness to technological experiences and market growth.

Market sectors are not enough: focusing on experiences created by sectors

Rather than examining broad sectors of health, we're focusing on specific points where technology and healthcare intersect. This allows us to see how open or adaptable people are to new technological experiences in healthcare. By aligning these insights with market growth, we can identify not only what the market wants but also what society is ready to embrace. It's a more nuanced way to forecast the future, taking into account both business viability and cultural acceptance.

By applying the CMIM, you will not only identify where the most lucrative opportunities lie but also understand where society is most receptive to technological advancements.

Pin-pointing the experiences enabled by each market sector

In our approach, each point on the Culture-market Intersection Matrix represents a unique combination of health technology subsector and the experience dimension. To derive this point, we multiply two key scores: the subsector score and the experience dimension score. The Subsector Score quantifies the market potential of healthcare technology areas like Wearable Tech and Smart Hospitals, ranging from 1 to 10.

The experience score measures cultural openness or adaptability towards technology across technological experience in health — also on a scale of 1 to 10.

By multiplying these two scores, we create a Matrix Point that integrates both market opportunity and cultural readiness. This balanced view allows us to pinpoint nuanced opportunities for innovation in health technology.

Culture-market intersections: insights from examined data

- Caution areas
- Cultural concerns
- Niche potential
- Active market

Embodiment

Score 7 | Body connection, related to Wearable Tech, Fitness, Nutrition & Mental Health Apps

Given the openness to wearables, innovators could design next-generation monitoring devices that are less intrusive and more informative. These could range from smart glasses, jewellery or patches that monitor data points.

Mediation

Score 6 | Interface relations, related to Digital Treatment & Care, Online Consultation

Platforms could be designed to give overviews of users' health data, with emphasis on transparency and accuracy. Also, a new cognitive and emotional mediator between patient, healthcare system, private and public, enhancing warmth, trust and control.

Agency

Score 5 | Sense of control, related to AI-driven Health Solutions, Genomics

The challenge here is to offer personalized solutions while ensuring that the user retains control over their data and healthcare decisions. Data dashboards that allow users to control who sees what could be a key feature.

Cultural values

Score 8 | Local values, related to Fitness, Nutrition & Mental Health Apps, Smart Hospitals

HealthTech solutions could incorporate Nordic cultural values or even traditional habits into modern health, fitness and nutrition practices, such as forest walk, saunas or native natural foods. This blend of tech and culture could result in uniquely Nordic solutions.

Design

Score 8 | Design as part of daily life, related to All

The Nordic emphasis on user-centric, intuitive design is an opportunity across all sectors. Designers should focus on setting standards for engaging and functional user interfaces.

Ethics

Score 3 | Perceive ethical issues in AI-driven Health Solutions, Smart Hospitals

Given the high standards for ethics, especially concerning data privacy, tech solutions must be designed with robust data governance frameworks. Ethics, sustainability and welfare of employees layers could become a unique selling point.

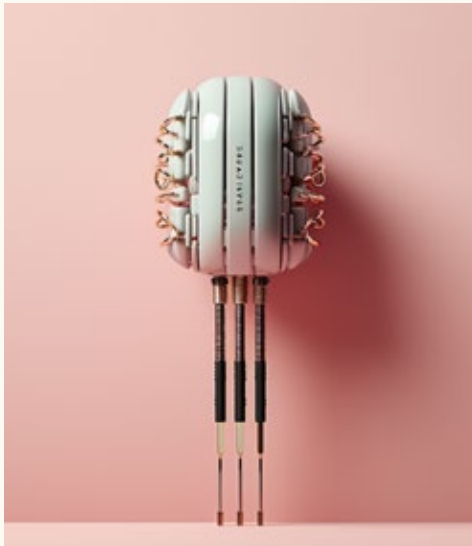
Biopower

Score 3 | Related to All, but especially Smart Hospitals and AI-driven Health Solutions

There's a need to ensure equitable access to healthcare technology, mental health and mitigate surveillance society uneasiness. Innovators and strategists could look into developing tiered services or community-based solutions that can reach wider demographics without creating power imbalances, governed or consulted by external bodies such as NGOs and grassroots movements.

⚠️ Takeaways for the present-future

Efforts to lower cultural barriers, set guardrails and capitalize the new wave of technology disruption



Technology is often only upgrading systems. This time we have a “pocket superbrain” accessible to all — and paradigms changes are expected in how patients are treated and on the fundamentals of how health professionals work.

Trustbuilding stages

The concerns with de-humanization and privacy are to be addressed, as well as an active building of trust towards ethics and the power technology in health has over our bodies.

If hyperscalers such as Google, Microsoft or Amazon Web Services continue to expand to health technology, proprietary issues, intellectual property and data privacy concerns are likely to rise. While many of those rules are clear (for example, with Microsoft’s Bing and Azure), concerns with commercial use of data from Google, Meta and other companies generate cultural mistrust in Big Tech.

Similarly, concerns with frontiers of AI, errors of AI and plain mistrust or unfriendly feelings towards the technology (say, “robots taking jobs”) may also be issues to mitigate both at the core and in perception.

This is not an upgrade: the changing healthcare paradigm with AI

The advent of AI and the emergence of smart hospitals represent a paradigmatic shift that is poised to redefine the entire healthcare ecosystem. This transformation goes beyond mere technological upgrades; it fundamentally alters how care is delivered, diagnosed, and managed. For instance, the trend toward remote consultations as the first line of care is not just a feature but a seismic shift in healthcare accessibility and resource allocation. Similarly, AI-driven diagnostics and treatment plans are challenging traditional medical specializations, requiring a new set of skills and knowledge from healthcare providers. These changes have a domino effect, affecting everything from payroll structures to work processes. Companies that fail to adapt may find themselves outpaced by more agile competitors who harness these innovations to offer better, faster, and more cost-effective care. In this changing landscape, preparation isn’t just advisable; it’s imperative. Companies must engage in strategic partnerships, upskill their workforce, and invest in new technologies to remain relevant and effective in the face of this disruptive change.

Exploring the ecosystem

A traditional and regulated area, health is like a shy kid playing on it’s own block. Strategists must find the opportunities for collaborations within and outside the ecosystem. Insurance companies, pharmaceuticals, telecommunication companies with 5G and edge computing, hardware manufacturers, gaming companies, nutritional services, genomic companies, fitness brands and many others are significant promises for healthcare companies, especially in the evolving AI ecosystem of the Nordics

Smart, remote, efficient and emotional

Similarly, the promising growth for Smart Hospitals calls for a “humanization” of interfaces. As interface interaction grow over face-to-face interactions, a new cognitive and emotional is on-demand for healthcare providers.

Backstage welfare

This goes similarly to the backstage tools that workers in the sector use. Employee welfare is common among established health corporations in the Nordics. The increase of digital interaction inside health facilities, during treatment and with patient care demands attention to interfaces that avoid fatigue, offer ease of use and work intuitively.

Research Institutions, Citizen Science Platforms and Public Agencies

Unseen Opportunity: Research institutions can partner with citizen science platforms to gather large-scale, real-world data for medical studies, dramatically expanding the scope and potential impact of research efforts.

Similarly, health companies, AI labs and public health agencies could lead to advanced predictive analytics for public health issues, from epidemic outbreaks to chronic disease management.

Methodology

Market data from Statista. When data not available, estimations made with OpenAI Advanced Data Analysis mode based on worldwide data, adapting to the Nordic market considering expenditure and sociocultural factors.

“Europe Genomics and Smart Hospitals Market Reports.” Market Data Forecast, [Market Data Forecast] (<https://www.marketdataforecast.com/>). Accessed 15 Oct. 2023.

“Digital Health in Northern Europe.” Statista, [Statista] (<https://www.statista.com/>). Accessed 15 Oct. 2023.

(1) “Online Doctor Consultations: Digital Health in Northern Europe.” Statista, <https://www.statista.com/outlook/hmo/digital-health/online-doctor-consultations/northern-europe?currency=usd>. Accessed 15 Oct. 2023.

(2) Digital Treatment & Care: Digital Health in Northern Europe.” Statista, <https://www.statista.com/outlook/hmo/digital-health/digital-treatment-care/northern-europe?currency=usd>. Accessed 15 Oct. 2023.

(3) “Digital Fitness & Well-being: Digital Health in Northern Europe.” Statista, <https://www.statista.com/outlook/hmo/digital-health/digital-fitness-well-being/northern-europe?currency=usd>. Accessed 15 Oct. 2023.

(4) *ibid.*

(5) Smart Hospitals Market in the Nordic Countries (Based on European Data): Estimations for 2024-2034. Adapting the European market data for the Nordic countries, the estimated market value for smart hospitals in 2024 is approximately \$0.79 billion USD.

The European CAGR for the smart hospitals market is 25.68%. Given that Europe and the Nordic countries share similar healthcare systems and technological adoption rates, this CAGR is applied to the Nordic countries as well. Using the given CAGR, the projected market value for smart hospitals in the Nordic countries by 2034 could be around \$7.74 billion USD.

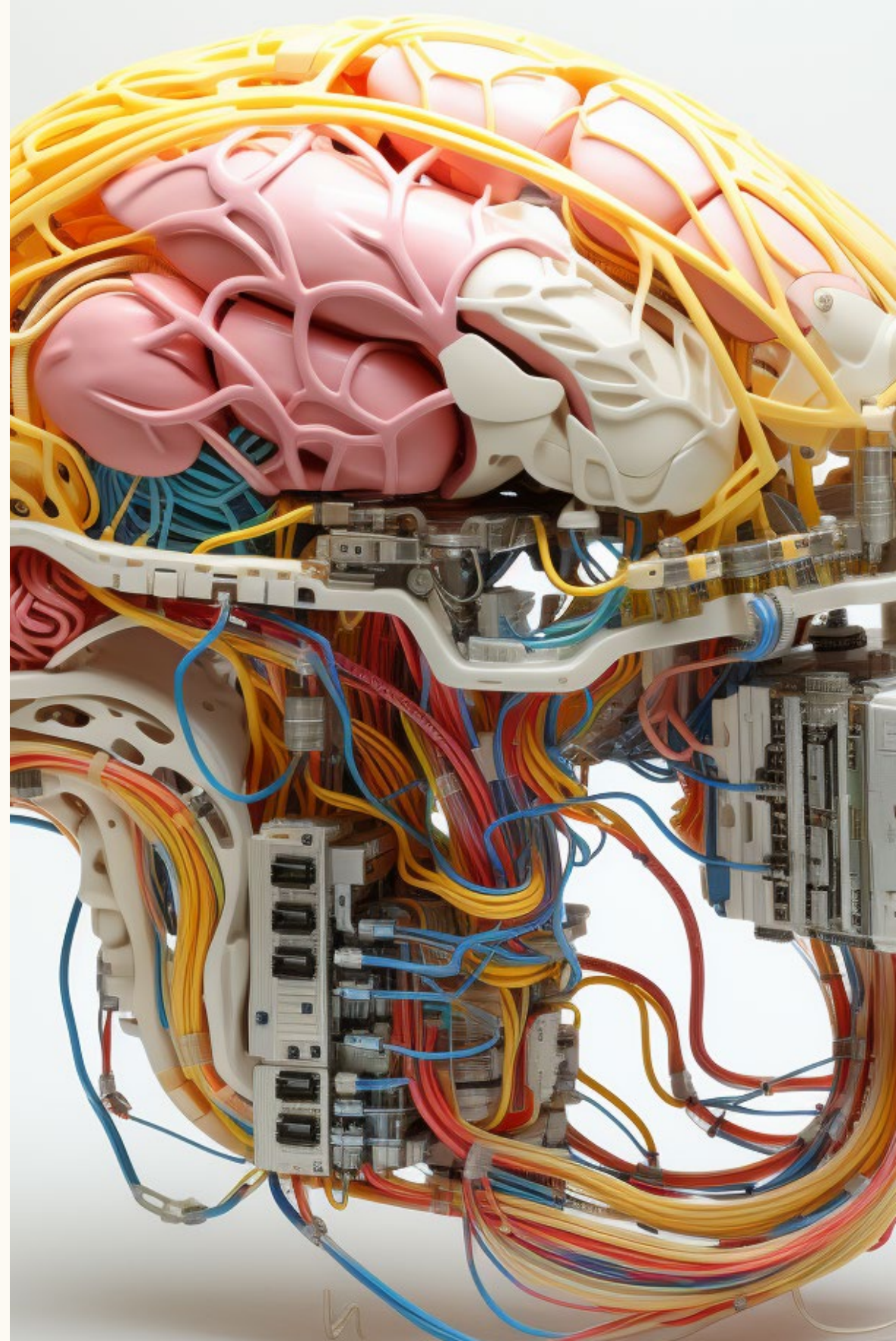
“Europe Smart Hospitals Market Report.” Market Data Forecast, <https://www.marketdataforecast.com/market-reports/europe-smart-hospitals-market>. Accessed 15 Oct. 2023.

(6) Genomics Market in the Nordic Countries (Based on European Data): Estimations for 2024-2034. Using the European market data as a basis and adjusting for the Nordic countries, the estimated market value for genomics in 2024 is approximately \$0.82 billion USD. The European CAGR for the genomics market is 9.6%. Given the similar economic and healthcare conditions, it's reasonable to apply the same CAGR for the Nordic countries. With the given CAGR, the projected market value for genomics in the Nordic countries by 2034 could be around \$2.06 billion USD.

“Europe Genomics Market Report.” Market Data Forecast, [Market Data Forecast] (<https://www.marketdataforecast.com/market-reports/europe-genomics-market>) (<https://www.marketdataforecast.com/market-reports/europe-genomics-market>). Accessed 15 Oct. 2023. These figures are estimations based on European market data and should be corroborated with specific research for the Nordic countries.

(7) AI in Healthcare: Market Value Estimations for the Nordic Countries. Value for 2023: Based on global trends and population ratio, the estimated market value for AI in healthcare in the Nordic countries for the year 2023 is approximately \$1.68 billion USD. Given that the global CAGR is 37%, a conservative estimate for the Nordic countries could be between 30-35%. Using the global CAGR, the projected market value for the year 2030 would be around \$15.26 billion USD. However, using the Nordic-specific conservative CAGR estimate, the market value could range between approximately \$10.57 billion USD and \$13.76 billion USD. These are speculative figures, based on current global trends, and should be validated through more specific regional market research.

“Artificial Intelligence (AI) in Healthcare Market Value.” Statista, <https://www.statista.com/statistics/1204318/smart-hospital-market-estimated-value-forecast/>. Accessed 15 Oct. 2023.





**FORE
SIGHT**

3

Insight, foresight

In this chapter, we explore potential futures for health and technology in the Nordics through scenarios.

These are not predictions, but structured possibilities based on current data and trends.

We'll start with dystopias, highlighting futures we might want to avoid.

Then, we'll discuss the 'probable' futures, move to the 'plausible' ones, and touch upon the less certain 'possible' futures. Afterward, we'll look at utopias, representing ideal outcomes.

The following chapter will zero in on 'preferable' scenarios, merging the probable with the possible to outline optimal outcomes.

As we delve into these scenarios, it is good to remember that today's actions influence tomorrow's outcomes.



Future headlights



A balanced view of the probable, plausible and possible

The scenarios ahead offer glimpses into potential futures over the next decade. Drawing from current trends and informed speculations, these narratives are not fixed predictions but explorations. They aim to highlight possible pathways, spotlighting areas of interest for innovators, designers, and strategists navigating the interplay of health and tech in this region.

Preferable futures In this model, the preferable future is not identified yet. Preferable futures are liminal spaces, pushing the borders of what is probable, plausible and possible — and it seemed a better idea to discuss it in a design phase.

Scoring Methodology Technology Acceptance (Weight: 40%): A high score in technology acceptance implies that the Nordic populace is more likely to adopt the technology. Market Size (Weight: 30%): A larger market size suggests a greater current interest and investment in that sector. Market Growth (CAGR) (Weight: 30%): A higher CAGR indicates strong future potential. The final score for each scenario is the weighted average of these three parameters.




Dystopias /Utopias

-  **Quantum-Powered Predictive Health** 3.8
-  **Emotional AI Therapists** 3.4

Possible futures



-  **Health Data Marketplaces** 5.6
-  **Genomics for All** 5.2




Plausible futures



-  **Hyper-Connected Health Ecosystem** 7.4
-  **AI-Powered Personal Health Assistants** 7.0
-  **Telemedicine as the First Line of Care** 6.8



Probable futures

-  **Biometric Social Networks** 3.6
-  **Augmented Dietary Assistants** 3.9

-  **Biohacking and Self-Optimization** 5.9
-  **Decentralized Healthcare** 5.6

-  **HealthTech Passports** 7.2
-  **Augmented Reality (AR) Health** 6.9
-  **Mental Health Tech Boom** 6.7

-  **DNA-Driven Life Planning** 3.3
-  **HealthTech Sanctuaries** 3.5

-  **Genomic Personalization of Medicine** 6.2
-  **Distributed AI Healthcare** 5.8
-  **Ethical Health Tech Governance** 5.4

-  **Fully Automated Health Monitoring** 7.1
-  **Neural Interface Medicine** 6.8
-  **Virtualized Healthcare Environments** 6.5

3 YEARS

5 YEARS

10 YEARS

Dystopias

Beyond scenarios, the realm of imagination



The life divide

As health technologies advance, a significant portion of the Nordic population struggles to access, understand or trust them. The gap between tech-savvy individuals and those resistant or unable to adapt widens. Fake news and radicalization takes a toll in health practices and adoption. While some benefit from personalized health insights and treatments, many are not, either from lack of resources, access, or acceptance of technology-enabled health practices.



The Surveillance State of Well-being

Governments, in the name of public health, mandate the use of wearable health monitors, apps and access to citizens' data. These devices, while effective in potential outbreaks and crises, become tools of surveillance. Personal data is no longer private, and individuals' every move, ailment is tracked and analyzed, leading to a society where personal freedom is compromised in the name of collective well-being. Lobbying encourages governments to allow private companies to access these databases, making the lines of public and private even more blurry.



AI Misdiagnosis Crisis

AI-driven health platforms become the primary diagnostic tool. However, flaws in their algorithms leads to waves of misdiagnoses. For example, diagnosing a dataset predominantly comprised of light-skinned individuals end up misdiagnosing conditions in darker-skinned individuals. This oversight not only perpetuates existing healthcare inequalities but also compromises the integrity of medical diagnoses, with real-world consequences for diverse populations. Algorithms are The fallout results in legal battles, loss of faith in technology-driven healthcare, and a resurgence of preventable diseases.

Genetic Elitism

Genomic personalization of medicine becomes mainstream, but it gives rise to a new form of elitism. Those with "favorable" genes receive premium treatments, better insurance rates, higher survival and fertility rates for their own children, and numerous social privileges in all spheres of life. In contrast, those with potential genetic risks are marginalized, facing discrimination not just in healthcare but in employment, relationships, and social standing. Society becomes stratified, not by wealth or education, but by DNA.

Futurenotes

The dystopias presented offer a recurrent theme of disparity and division, whether it's the widening health-tech gap, surveillance overpowering individual freedoms, AI missteps eroding trust, or genetic elitism creating societal stratification. What's striking is how these scenarios contrast diammetrical opposites of Nordic values. Historically, the Nordic model has emphasized social cohesion, trust in institutions, and a commitment to equality. These dystopias, in essence, challenge the foundations of Nordic societies: they hint at a potential erosion of trust, emphasize individualism over collective welfare, and spotlight the risk of deepening inequalities.

Probable futures

Scenarios that are likely to occur based on current trends, data, and prevailing conditions



3 YEARS

The Hyper-Connected Health Ecosystem

Integration becomes the keyword. Wearables, home health devices, telemedicine platforms, and even fitness equipment begin to communicate seamlessly, creating a mesh of interconnected health data.

Nordic governments encourage this by supporting open standards and protocols, and big local and global players push boundaries and get pushed back by regulations continuously.

Data privacy and security become paramount. There's a need for robust, transparent systems to reassure users about their personal health data's safety.



3 YEARS

Telemedicine as the First Line of Care

With advancements in remote diagnostic tools and the popularity of telemedicine platforms, many Nordics begin to use telehealth consultations as their primary healthcare touchpoint, visiting physical clinics only when absolutely necessary.

The human touch in medicine might seem diminishing. Ensuring patients still feel cared for and understood in a largely HealthTechcare journey is essential.



5 YEARS

Rise of AI-Powered Personal Health Assistants

AI-driven health assistants become mainstream. These virtual entities, integrated into smartphones and home devices, provide real-time health advice, schedule medical appointments, and even conduct basic diagnostic conversations.

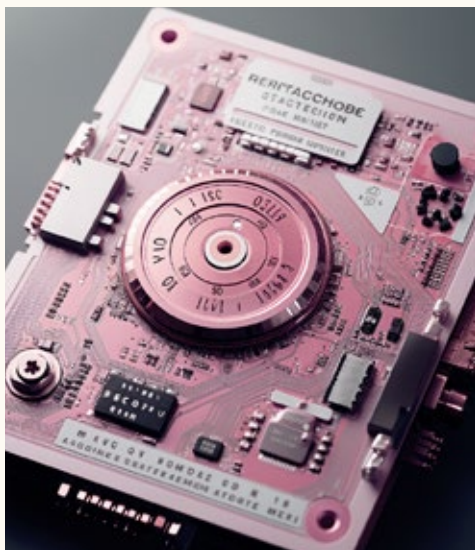
There are concerns about the accuracy and reliability of AI-driven diagnoses. Ensuring these tools are complementary to healthcare professionals, rather than replacements, becomes crucial.

* Internodes



"Only sustainable companies will survive. Environment-wise, society-wise and governance-wise. I don't see many doing enough at the moment to stay competitive in the future."

Lotta Siutla
Prenatal Segment Leader at Revvity



5 YEARS

HealthTech Passports

With the proliferation of health data from various sources, Nordic countries introduce HealthTech passports. These contain a person's comprehensive health profile, vaccination records, genomic data, and more, accessible instantly from any device.

Standardizing data across countries and platforms is complex. Balancing accessibility with data privacy becomes paramount.



5 YEARS

Augmented Reality (AR) Health

AR becomes integral to healthcare. Patients use AR glasses/lenses for physiotherapy sessions at home, guided by virtual physiotherapists. Surgeons employ AR for intricate surgeries with real-time data overlays.

The initial cost of AR tech may be prohibitive. Ensuring accuracy and reliability in virtual health guidance is crucial.



5 YEARS

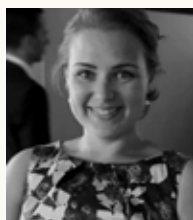
Boom of Mental Health Tech

Recognizing the growing mental health challenges, there's a surge in digital solutions targeting mental well-being. Virtual reality (VR) therapy sessions, reenactment therapies in immersive realities, AI-driven mental health chatbots, and mood-monitoring wearables become standard.

While effectiveness is ensured over time and with due research, unlicensed practitioners and organizations capitalize the trend and end up creating more harm than good in fringe communities and preying upon vulnerable individuals.

The sector evolves aligning research practices to verify efficacy and risks, governing bodies and regulations.

* Internodes



"I see a significant change in how people talk about their own mental health. There was a fear of not being understood, even by a professional. A fear of hearing "this is all in your mind". When people stopped accepting this, they accepted to be vulnerable. They started speaking up about stress, LGBT rights, women's health. This is also a call for a holistic approach to health."

Sofia Strömmer Chartered psychologist, behavioral scientist at Oura

↔ Pathways

As we rely on technology to manage health, a crucial pathway emerges at the intersection of data surveillance and individual privacy. On one side, health databases and digital health passports promise streamlined healthcare, immediate access to medical history, and efficient pandemic control. On the other side, such systems pose risks to privacy, potentially granting governments, insurers, and employers unprecedented access to intimate details of our lives. This pathway forces us to confront questions about data ownership and consent, as well as the ethical limits of surveillance in the name of public health. Balancing these dual imperatives of utility and privacy is a complex challenge that will shape the future landscape of healthcare technology.



10 YEARS

Fully Automated Health Monitoring

The concept of regular health check-ups evolves. Citizens wear advanced biometric devices that continuously monitor vital signs, blood markers, and even molecular health indicators, providing real-time feedback and alerts.

The challenge is to secure and manage the vast data streams efficiently, including bias detection, algorithmic mistakes, false alarms and prevention. Addressing concerns about continuous health surveillance is also at stake, especially when data is used for public health and data output is tracked by companies for commercial purposes.



10 YEARS

Neural Interface Medicine

Brain-computer interfaces (BCIs) become a significant part of the health tech landscape. They assist in neurological treatments, mental health therapies, and even augment cognitive abilities.

Ethical implications of augmenting human cognition play a role, as well as the sense of agency and individuality. The debate is extensive, transcultural and without consensus, potentially leading to another divide in opinions and in the population.



10 YEARS

Virtualized Healthcare Environments

The boundary between physical and virtual healthcare blurs. Patients can enter fully immersive virtual hospitals for consultations, therapy, or even guided meditation and relaxation, all from their homes.

Ensuring the effectiveness of virtual treatments compared to traditional methods. Addressing potential feelings of isolation in entirely virtualized care.

Pathways

The advent of technologies enabling interventions in neural networks and genetic manipulation opens ethical and existential questions. These technologies present diverging pathways for what it means to be human. On one hand, neural enhancements could propel us to unprecedented cognitive heights, but at what point do we cease to be ourselves? Similarly, genetic modifications in embryos may eradicate hereditary diseases, but they also invite the specter of designer babies, raising concerns about biological inequity. Each pathway carries its own set of ethical quandaries and societal implications, creating a divide that humankind will have to navigate cautiously in defining the boundaries of our humanity.



Innovation or overreach?

by Juha Juosila

Board member of Innokas Medical. Former CDO/CIO of Terveystalo

Ethics and Privacy in Nordic Technology

The Nordics face a key weakness in their use of public clouds: the ambiguity of whether it's permissible and under what conditions. While there are numerous benefits, including cybersecurity, the EU's unclear stance is problematic. Additionally, issues around consent and the appropriate use of data for service improvement and patient benefit highlight how stringent interpretations can stifle progress.

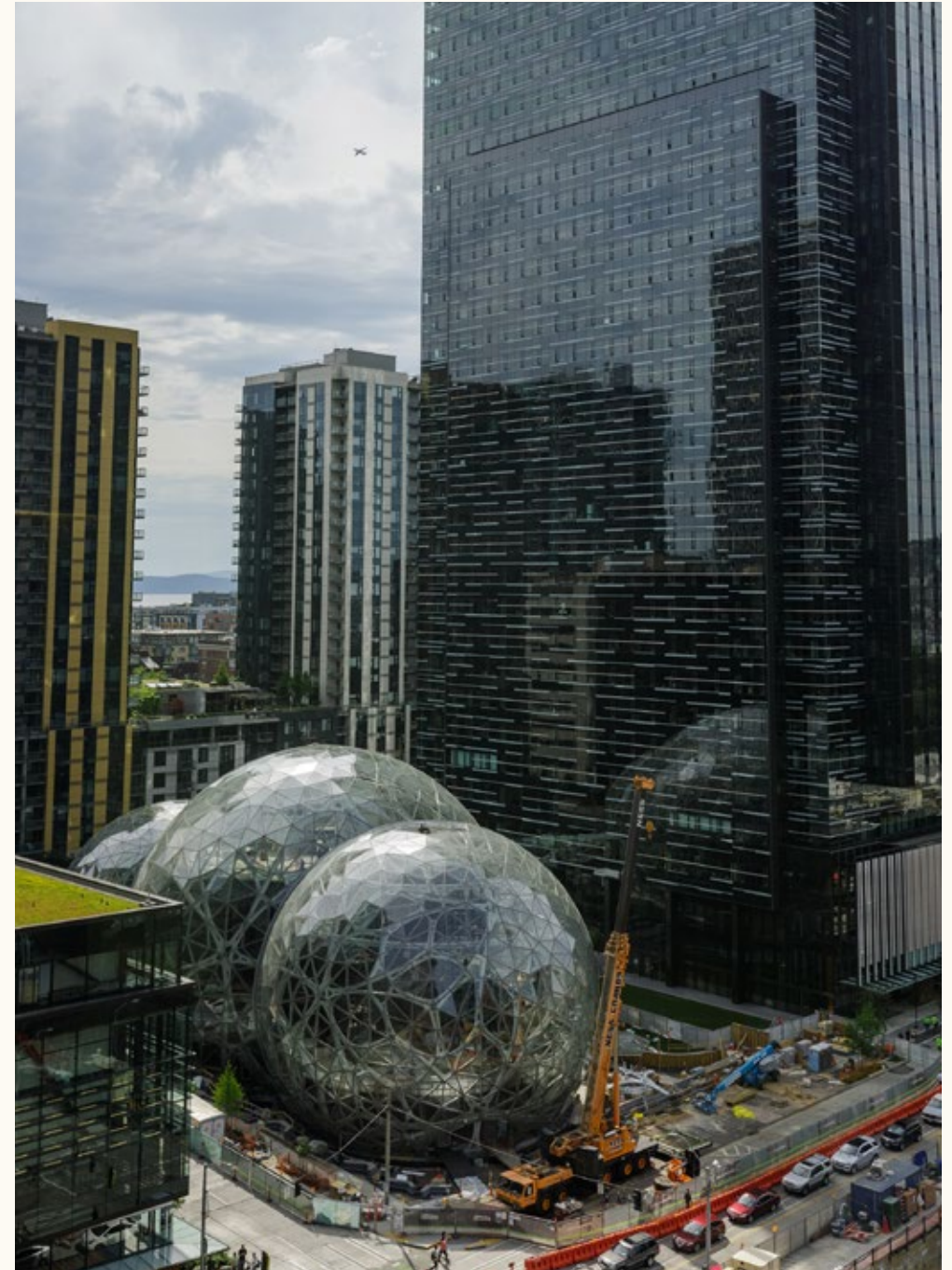
Smart Hospital Pitfalls

When it comes to the growth of smart hospitals, the term itself is quite broad. For instance, Terveystalo has exhibited characteristics of what might be considered a 'smart hospital' for some years, particularly with its near-live data flow. However, if we define smart hospitals as those using AI to enhance operations, then we run into common AI issues. Resource planning might be oversimplified, and the use of AI in patient treatment and steering decisions carries significant risk. The selection of inappropriate KPIs can also misdirect operations, causing conflicts between patient well-being, treatment outcomes, cost-effectiveness, insurance expenses, and hospital profits.

“There’s a particular concern with non-healthcare providers gaining significant market share and then leveraging the data and customer insights for unrelated business ventures.”

Digital Health Giants: Threats and Opportunities

The presence of oligopolies in the Nordics and the combination of global tech companies with startups abroad presents both ethical challenges and opportunities. There's a particular concern with non-healthcare providers gaining significant market share and then leveraging the data and customer insights for unrelated business ventures. For example, the previous situation where OP controlled insurances, mortgages, bank accounts, investments, and health services (via OP Omasairaala) was, in my view, a dangerous combination. It gave too much influence over individuals' lives. The same potential for overreach exists with larger entities, and it's something we should monitor closely.



What is a hyperscaler?

Hyperscalers are massive cloud computing and data center providers, such as AWS, Azure, and GCP, known for their unparalleled scale and global reach. These companies operate vast infrastructure that offers businesses access to highly scalable and powerful computing resources. While their services enable businesses to scale rapidly and efficiently, the concentration of data and computing power in the hands of hyperscalers also raises concerns about their potential control and influence over sensitive data, as well as the broader implications for data privacy and security in the digital age. In the photo, Amazon's headquarters in Seattle.

Plausible futures

Scenarios that, while not guaranteed, are conceivable based on known factors



3 YEARS

Genomics for All

Genomic testing becomes affordable and widespread. Nordic residents regularly get genomic screenings, with the data informing personalized health plans, nutrition advice, and even fitness routines.

There are potential implications for data privacy, insurance biases, and the risk of over-reliance on genetic data, sidelining environmental or behavioral health factors.

* Internodes



“The Nordics offer fertile ground for innovation. The great scientific knowledge, academic research, startup scene and investors (both private and government) create great opportunities. Yet, the true challenge is to commercialize great ideas. Forging a compelling brand and value proposition early in a venture, particularly in Life Sciences, is crucial to transforming groundbreaking ideas into impactful, market-ready innovations.”

Sofia Lund, Brand & Startup Consultant, CEO, Founder, S Factor Company



3 YEARS

Health Data Marketplaces

As users generate vast amounts of health data, platforms arise that allow individuals to voluntarily sell or share their anonymized health data with researchers, pharma companies, or health tech innovators.

Sale of such data could incentivize more detailed and frequent health monitoring, leading to data that is beneficial for individualized healthcare plans. sold to research institutions, the data could contribute to medical advancements that benefit society at large.

However, it is challenging to ensure that individuals fully understand the implications of selling their data, potentially leading to consent issues. Those in desperate financial situations might be more inclined to sell sensitive data, perpetuating cycles of exploitation. Once sold, control over how data is used or who has access to it may be lost, leading to potential misuse, such as discrimination by employers or insurance companies.



5 YEARS

Biohacking and Self-Optimization

A significant segment of the Nordic population begins to engage in biohacking — using tech to optimize their physiology, cognitive abilities, and longevity. This includes nootropics, implants, and personalized nutrition based on genomic data.

The long-term effects of such interventions are unknown. There could be socio-economic divides between those who can afford such optimizations and those who can't.

Similarly to the use of steroids, nootropics and implants may have waves of “too early adoption” and populations affected by unknown risks of these enhancements, which may vary from life threatening risks to long-term dependency.



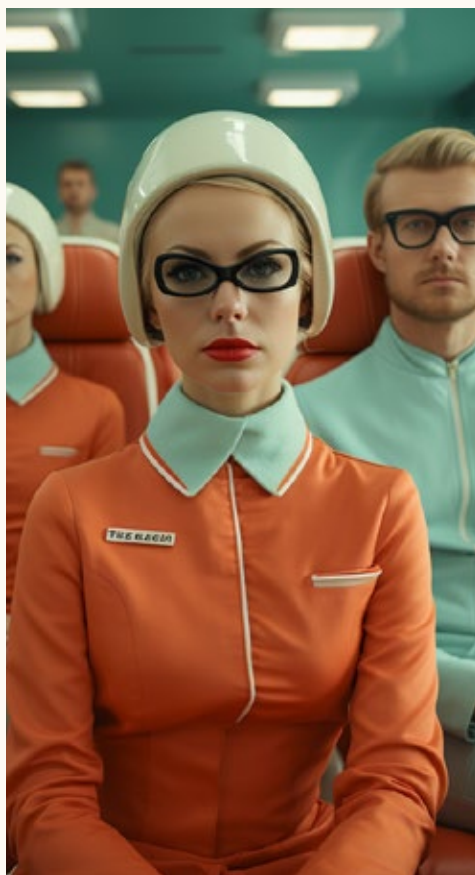
5 YEARS

Decentralized Healthcare

The concept of centralized hospitals starts phasing out. Instead, localized health hubs equipped with the latest telemedicine tools, AI-driven diagnostics, and even remote-controlled robotic surgery tools serve communities.

There are challenges in ensuring the quality of healthcare remains consistent across these decentralized hubs. Similarly, training healthcare professionals for this new paradigm is a challenge in the horizon.

Above, a train wagon equipped with traveling medical procedures.



10 YEARS

Ethical Health Tech Governance

With the advancements in health tech, Nordic countries establish strict ethical governance bodies. These oversee the development, deployment, and usage of health technologies, ensuring they align with societal values and human rights.

Striking a balance between innovation and regulation, addressing global discrepancies in health tech governance, exporting the model abroad and educating other economies on the matter, in a form of "HealthTech diplomacy"



10 YEARS

Hyperscalers' Healthcare

Localized AI hubs, powered by quantum computing and offered in global scale by companies and/or governments, may handle most primary healthcare duties. Access to big data allows for highly personalized medical care.

These AI units can synthesize global medical knowledge to provide diagnostics. Unlike human doctors, AI systems can be updated globally, ensuring that all hubs are equipped with the latest medical information.

They may prescribe treatments, compute patient improvements to the body of scientific knowledge with a "sample of 100% of the

population". These intelligences may even offer immediate, 24/7 mental health support, which could be a significant advancement in public health.

In this scenario, risks are measured at scale — not one doctor misdiagnosing one patient, but an AI intelligence misdiagnosing entire populations or offering erroneous mental health advice to populations that deceived the AI as not being at risk. Furthermore, a global system poses difficulties in oversight and quality control, including the validation of diagnoses and treatments across different jurisdictions.

Possible futures

Scenarios that may conceivably occur, even if it's unlikely or speculative



3 YEARS

Emotional AI Therapists

A breakthrough in AI's ability to understand and process human emotions leads to the rise of "Emotional AI Therapists" in the Nordics. These AI entities, available as text apps, voices, virtual reality guides, in-app features of more extensive treatments and even as support to human therapists, provide immediate mental health support, understanding users at an emotional level and offering therapeutic conversations anytime, anywhere. These are especially important for patients suffering from alienating mental illnesses, such as dementia. To many patients, strong emotional bonds are formed with these companions, to some extent substituting social interaction and human relationships.



3 YEARS

Augmented Nutrition

With the evolution of AR lenses such as Humane AI, users look at food and their AR device instantly analyzes its nutritional value, offering real-time dietary advice, calculating its impact on the user's health metrics, nutrition breakdown, caloric count and suggesting healthier alternatives or portion sizes.

10 YEARS

DNA-Driven Life Planning

A revolutionary service emerges in the Nordics, offering "Life Planning based on DNA." Using a combination of gene sequencing and AI, individuals receive detailed life roadmaps predicting potential health, emotional, and social challenges they might face. From career choices that align with one's genetic predispositions to finding life partners with complementary DNA, this service redefines life planning at a molecular level, and opens new questions about genetic manipulation during assisted reproduction processes.



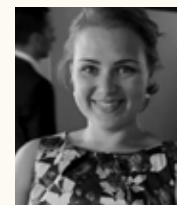
10 YEARS

Digital-less Sanctuaries

With the rise of digital distractions and technology-induced stress, "sanctuaries" become a trend in the Nordics. These are physical locations where no digital devices are allowed. Instead, ancient healing practices are combined with modern neuroscience to offer holistic well-being. People visit these sanctuaries to detox from digital overload and reconnect with their inner selves, attracting tourist and adepts of the lifestyle.



* Internodes



"I see a significant change in how people talk about their own mental health. There was a fear of not being understood, even by a professional. A fear of hearing "this is all in your mind". When people stopped accepting this, they accepted to be vulnerable. They started speaking up about stress, LGBT rights, women's health. This is also a call for a holistic approach to health."

Sofia Strömmer, chartered psychologist, behavioral scientist at Oura

Utopias

After scenarios, the realm of imagination



3 YEARS

The Quantum Leap in Mental Well-being

A groundbreaking Nordic collaboration harnesses quantum computing in mental health research. This results in the development of personalized therapies that can preemptively address mental health issues before they manifest. Depression rates plummet, and the region experiences a renaissance of joy, creativity, and productivity and cultural and emotional adaptability to the constant changes of the social fabric.

5 YEARS

Genetic Renaissance

Nordic scientists unlock “super longevity” genes, leading to treatments that not only extend life but ensure those additional years are lived in excellent health. Age-related diseases become a thing of the past, and the elderly contribute actively to society, blending wisdom with vitality. This genetic renaissance reshapes societal structures, with multi-generational collaboration becoming the norm.



10 YEARS

Universal HealthTech

In a swift and unified move, Nordic countries pioneer a HealthTech revolution, offering every citizen free access to top-tier HealthTech platforms. While the technology diagnoses and predicts issues, partners in global economies supply physical goods, logistics and other needs with modic prices, sponsored by further partnerships. These platforms, tailored to individual needs and scaled globally, lead to a significant decline in chronic diseases, including mental illnesses. The integration of “AI-driven health with a human touch” results in a healthcare utopia, setting a global benchmark.



DESIGN

Designing a preferable future

As we transition from exploring the spectrum of potential futures, we now focus on preferable futures.

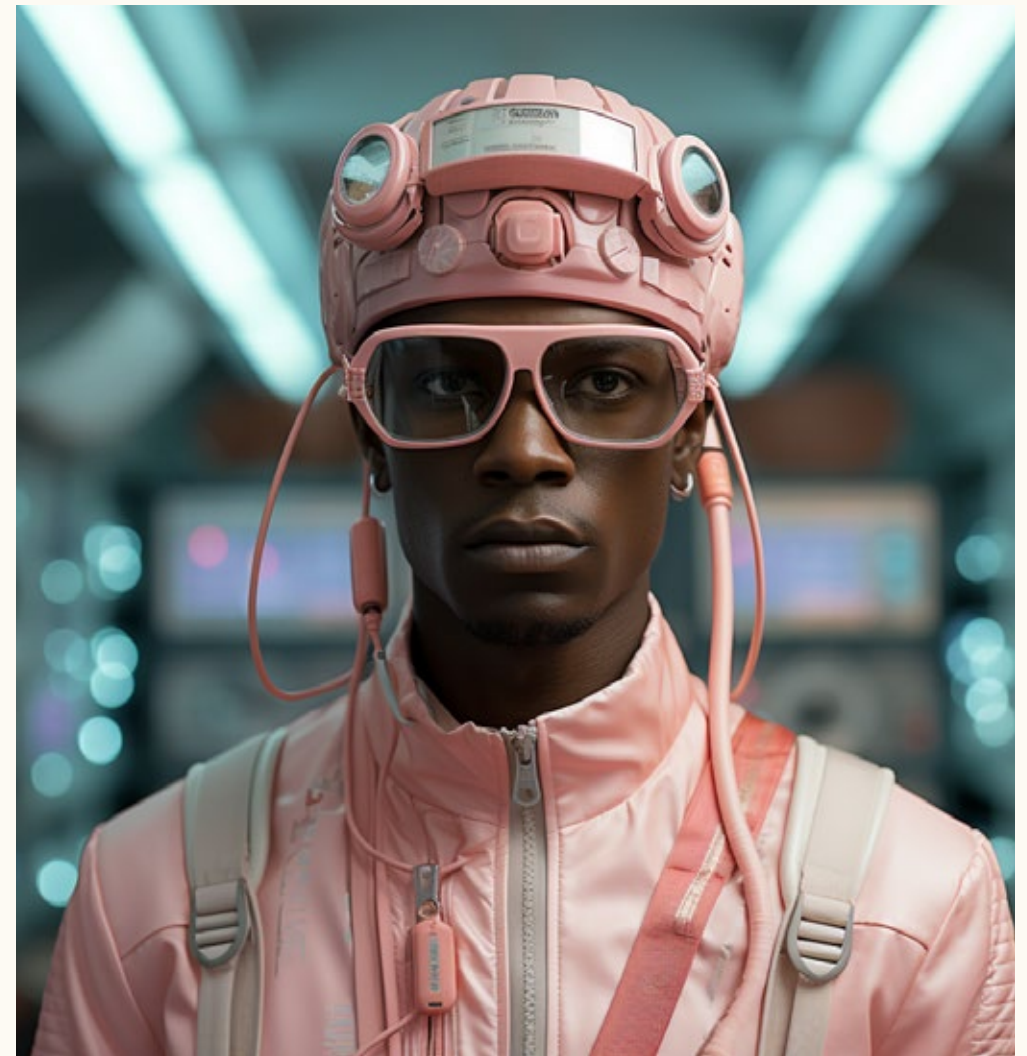
In the realm of strategic foresight, preferable futures represent a curated blend of what is both probable and possible, yet going to a direction that makes the future more sustainable, integrated and equitable.

They are not utopias, but are scenarios grounded in reality, optimized for desired outcomes while being attuned to current data and emerging trends.

For strategists, service designers, innovators, and decision-makers, understanding preferable futures is a source of inspiration.

It allows for the creation of roadmaps that are both visionary and actionable. By aiming for these futures, organizations can set clear, aspirational goals while ensuring their strategies are rooted in the real-world context.

Preferable futures act as beacons, guiding the way forward, ensuring that actions taken today are in service of creating a tomorrow that is not only possible but also aligned with collective aspirations and values.



Pathways: Inclusivity vs. Solutionism

The thread that could weave these various opportunities into a preferable future is ethical and inclusive design. Whether it's AI-driven healthcare plans or drone delivery of medical supplies, the projects that prioritize ethical considerations and inclusivity are those most likely to produce equitable, sustainable outcomes.

Conversely, the element that could take us down a less desirable path is technological solutionism—the belief that technology, in and of itself, can solve complex human problems. The allure of cutting-edge technology can

sometimes blind us to the nuances of human experience, leading to solutions that increase existing inequalities or introduce new ethical dilemmas.

Ethical and inclusive design implicitly builds trust—trust that technology will serve broad human interests rather than narrow corporate or governmental agendas. Technological solutionism, on the other hand, often consolidates power—power that might lie with those who control the technology, rather than those who the technology is meant to serve.

Speculative near futures

In the next three years, the Nordic countries witness a transformative leap in digital health.

Powered by AI, first-line health services become more accessible and affordable, positioning healthcare attendants as guides rather than gatekeepers. User interfaces embody the pinnacle of intuitive design, offering real-time translation and enhanced rich media options like voice, video, and photographs.

Data storage is no longer a puzzle but a streamlined process, with centralized databases that transparently communicate who has access to what information. Back-end tools

experience a revolution in usability and aesthetic design, and B2B compatibility ensures seamless interconnection of services.

This fluid exchange of information, both on the front and back ends, acts as a catalyst for unprecedented improvements in healthcare. Health platforms evolve into vibrant marketplaces, attracting an ecosystem of professionals and companies dedicated to well-being. This shift not only enhances the quality of healthcare but also broadens its scope, making the Nordics a model of health and technology integration.

What would have to be true?

The productivity gains and partnership opportunities of user-friendly and intuitive interfaces on B2C and B2B fronts are made clear for decision-makers and boards

Legislative bodies should facilitate the development and deployment of these technologies by setting standards and guidelines that promote innovation while ensuring safety and equity.

Data privacy concerns are adequately addressed, ensuring user trust in HealthTech platforms.

Public and private sectors collaborate seamlessly, as well as new partnerships among private entities, ensuring that resources and knowledge are shared for the collective good.

Ethical and practical frameworks for long-term studies using real-world data must be established to make the best use of continuous data collection for scientific research.

Continuous feedback loops are established to iterate and improve upon HealthTech resources based on real-time user needs and feedback.

Expanded opportunities

Personalized Health Plans

With easy access to centralized health data, AI algorithms could devise highly personalized healthcare plans, integrating not just medical history but also real-time health metrics.

Local Networks

The digitized, interconnected system could extend its reach to remote Nordic areas, offering specialized consultations through AI-assisted telehealth services and serving as a service platform for local health practitioners.

Segmented Health

The platforms could host segmented health modules for various demographics, offering resources and interventions that are culturally and age-specific. These are a delicate intertwine between market appetite and culture-sensitive care.

Wellness Integrations

Partnerships with wellness providers like gyms, mental health counselors, and nutritionists could offer a holistic health approach, right within the platform.

Global Partnerships

The Nordic model could serve as a prototype for other countries, fostering international collaborations and data-sharing initiatives for global health improvement.

Scientific data at scale

With rigorous ethical oversight to ensure that data is anonymized and used solely for

the advancement of public health, newly structured data collection at doctors' offices can be a boom for scientific research. The richness and scale of real-time health data can facilitate long-term studies on health conditions and treatment efficacies. AI could sift through this expansive data to identify patterns that may not be immediately visible to human researchers, thus accelerating the pace of medical breakthroughs.

Social Ecosystems involved

Educational institutions (for training programs)

Non-profit organizations focused on health and digital literacy

Local community leaders and influencers

Patient advocacy groups

Business Ecosystems involved

HealthTech platform providers

Telecommunication companies (infrastructure)

Medical institutions and healthcare professionals

Strategy works for exploring new partnerships

Design practice for services and products

Data security and privacy firms

Government regulatory bodies

Requests from the Future

Requests for Proposals from the preferable three next years

This chapter, “RFPs from Preferable Futures,” serves as a speculative exercise that delves into the kinds of projects companies are likely—or should be—requesting in the near future. Focused on strategic and design work, these Requests for Proposals (RFPs) are imagined blueprints that guide the conception and implementation of services designed to build a more equitable, efficient, and human-centered healthcare landscape in the Nordics. By considering these RFPs, we can explore the potential pathways for leveraging technology to create a preferable future in health and well-being.



Personalized Health Platform

Develop a platform that employs AI to create personalized healthcare plans for individuals, integrating medical history with real-time health metrics

Type of Work Needed

Custom Software Development, Data Analytics, UX/CX Design, Cloud Services, Service Design, Regulatory Compliance

Strategy and design requirements

Overlook the adoption of a data architecture design for collecting and storing patient data securely, and which meets the necessary scope of pilot and speed for scale.

Overlook the development of AI algorithms for personalized healthcare planning, including partnerships with leading AI vendors.

UX design for patient interface, healthcare professionals interfaces, administration interfaces and other backstage interface needs, including for B2B partners using the solution as API or whitelabel.

CX design for patient engagement and follow-up, including patient apps, wearables and other uses.

Regulatory compliance checks and audits.

Intuitive user interface for patients to interact with their healthcare plans.

Dashboards for healthcare providers to monitor patient progress and make adjustments to plans.

A seamless service experience that guides the patient from onboarding to ongoing engagement.

Scientific Data at Scale

Structure new methods of data collection at healthcare providers' offices to facilitate scientific research

Type of Work Needed

Data Collection, Data Analytics, Ethical Oversight, Strategy Development



Photo by Massimo Botturi

Strategy and design requirements

Design of ethical data collection methods.

Development of AI algorithms for pattern identification.

Strategy for long-term data storage and access for research institutions.

Dashboards for researchers to interact with and analyze the collected data.

Ethical guidelines and protocols for data collection, storage, and usage.

User-friendly interfaces for doctors and patients to use and collect data seamlessly in their day-to-day activities and interactions.

Global Health Partnerships

Develop international collaborations and data-sharing initiatives based on the Nordic health models

Type of Work Needed

Strategy Development, Partnership Development, Service Design

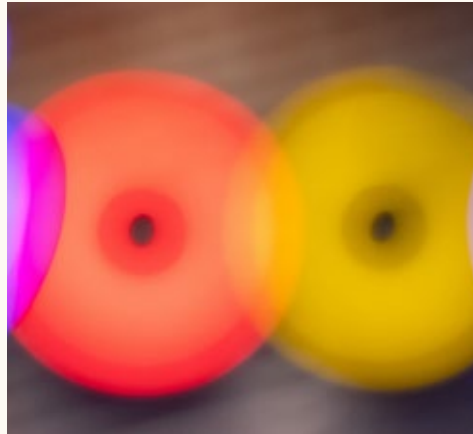


Photo by Mitchell Luo

Strategy and design requirements

Ecosystem mapping and trend study of which role each hyperscaler and health giant has taken so far, and plans to take ahead

Partnership development with international health organizations, to streamline regulations and right-to-play.

Service blueprints that outline the process of international collaboration from initial contact through to ongoing partnership.

Strategic planning for international expansion.

Partnership development with international health organizations.

Service design for global health platform integration.

Wellness Integrations

Integrate wellness services like gyms, mental health counseling, and nutrition consultations into an existing healthcare platform

Type of Work Needed

API Development, Partnership Development, UX/CX Design, Service Design



Photo by Onur Binay

Strategy and design requirements

API development for integration of wellness services.

CX design for holistic health experience. Development of proof of concept so that appetite for partnerships are tested, including calculations.

If successful, develop pilot project with selected partner, in MVP (Minimum Viable Product) basis.

User-friendly interfaces for selecting and engaging with wellness services.

Customer journey maps that integrate wellness services into the overall health experience.

Plan go-to-market strategy when pilot successfully gets traction.

Remote Areas Networks

Extend telehealth services to remote Nordic areas through an interconnected system that also serves as a service platform for local health practitioners.

Type of Work Needed

Telehealth Platform Development, UX/CX Design, Partnership Development



Photo by National Cancer Institute

Strategy and design requirements

Expansion of existing telehealth services to include AI-assisted consultations.

UX design for remote consultation interfaces.

CX design for overall patient experience.

Service design for integrating local health practitioners into the platform.

Development of partnerships with local health agencies.

User interface for remote consultations, optimized for low-bandwidth conditions.

Service blueprints outlining the patient journey from initial contact through consultation and follow-up.

Speculative niches

Advanced ideas for niche markets, specific community needs or applications of emerging technologies likely to mature soon

There is no exhaustive list of possibilities for the upcoming years in the Nordics. Here are a few more, brought by authors, discussions and advance analytics AI:

Mental Health Chatbots for Youth

Develop an AI-driven chatbot specialized in providing mental health support for young people. The chatbot would serve as a first point of contact for those who may be hesitant to seek professional help.

Virtual Reality Physiotherapy

Create a Virtual Reality (VR) platform that offers physiotherapy exercises and sessions, allowing patients to perform guided exercises at home while sending real-time data to healthcare providers.

Blockchain for Drug Traceability

Implement a blockchain system to track the production and distribution of pharmaceuticals, ensuring authenticity and reducing the risk of counterfeit medications.

Predictive Analytics for Epidemic Response

Use AI to analyze health data and develop predictive models for potential epidemic outbreaks, allowing for quicker, more effective responses from healthcare providers and government agencies.

AI-Assisted Elderly Care

Implement AI-driven monitoring systems in elderly care homes to predict falls, medication needs, or sudden health declines, alerting caregivers immediately.

Digital Twins for Personalized Treatment

Create a digital twin technology that simulates patients' physiological responses to different treatments, enabling highly personalized healthcare plans.

Drone Delivery for Medical Supplies

Develop a drone delivery system to transport medical supplies to remote or hard-to-reach areas in the Nordics, particularly during harsh weather conditions.

Gamification of Chronic Disease Management

Design a platform that uses gamification techniques to encourage patients to manage chronic conditions like diabetes or hypertension more effectively.

Biofeedback Apps for Stress Management

Create a mobile app that uses biofeedback to help users manage stress, with real-time metrics and guided interventions based on physiological responses.

What else?

Each of these projects tackles specific needs or leverages emerging technologies, making them suitable for either niche markets or broader, systemic transformation in the health and technology sectors of the Nordics. Those are not enough — give it a go yourself, as creativity and strategic thinking are what keep the innovation wheel spinning.



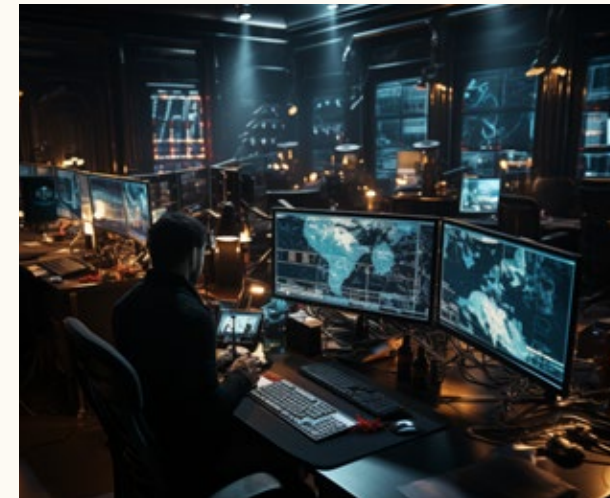
A portable device would allow for early detection of conditions like diabetic retinopathy. Patients can perform a simple scan at home, with AI analyzing the images for signs of disease progression, ensuring early intervention and continuous monitoring without frequent hospital visits.

Double-clicking on partnerships

Future partnerships are an untapped wealth of opportunities. Those who can master the art of networked ideas will open important paths to the development of Nordic HealthTech

These speculative partnership opportunities serve as conceptual launching pads, designed to help form mental models of what's possible in the evolving healthcare landscape.

They illuminate unseen opportunities and untapped value by crossing traditional industry boundaries and envisioning synergistic collaborations. The aim is not merely to inspire, but to create a scaffold upon which designers, strategists, and stakeholders can build their plans. By considering these potential partnerships, professionals are encouraged to view challenges and opportunities through a multi-disciplinary lens. This expanded viewpoint fosters connections between seemingly disparate sectors, catalyzing innovative solutions that could redefine healthcare delivery and outcomes. In essence, these speculative ideas function as platforms for ideation, enabling stakeholders to act with greater foresight, creativity, and impact.



Telecommunication Companies and Remote Monitoring Services

Telecommunication companies already possess the necessary infrastructure for large-scale data transfer and communication. By partnering with remote health monitoring services, these companies could offer a specialized, secure, and efficient network for transmitting real-time health data, especially valuable in rural or hard-to-reach areas.



AI-Driven Diagnostic

Tools that use AI to assist in diagnosing diseases from images like X-rays, MRIs, or CT scans. They can provide second opinions to doctors, increasing diagnostic accuracy and speed



Photo by Sincerely Media

Citizen Science Platforms

By collaborating with citizen science platforms, research institutions can access a vast pool of voluntary contributors who can provide data or even participate in simple experiments. This democratizes the research process and offers a wealth of real-world data that could make academic research more applicable and impactful.



Mental Health Services and Virtual Reality Studios

Virtual reality offers an immersive environment that has shown promise in treating various mental health conditions, from PTSD to anxiety disorders. A partnership with mental health services could lead to the development of VR-based therapeutic interventions, offering a new layer of treatment options.



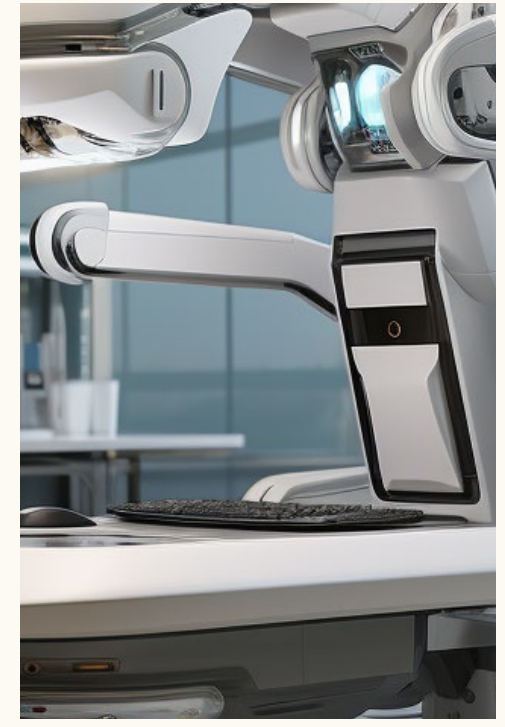
Automated Sterilization Robots

These robots use UV light and other sterilization methods to autonomously clean hospital rooms and equipment, reducing the risk of hospital-acquired infections. They can navigate around the hospital independently, ensuring a sterile environment.



AI-Powered Rehabilitation Tools

Devices that assist in rehabilitation, like robotic exoskeletons or smart prosthetics. They can adapt to a patient's progress in real-time and provide data to therapists for rehabilitation plans.



Robotic Surgical Assistants

Robots that assist surgeons during operations, offering precision and control beyond human capabilities. They can be remotely controlled or provide AI-assisted guidance during procedures.



AI Research Labs and Public Health Agencies

AI labs specialize in data analysis and predictive modeling, skills that are increasingly crucial in public health decision-making. A partnership could lead to the development of advanced predictive analytics tools that can forecast everything from epidemic outbreaks to the long-term healthcare needs of a population.



Nutritional Services and Genomic Companies

Genomic companies can offer insights into how individual genetic makeup can affect dietary needs and health outcomes. By partnering with nutritional services, a new avenue of personalized nutrition plans can be created, optimized to an individual's unique genetic makeup.

Smart IV Drips

These IV drips can adjust the flow of medication or fluids based on real-time data from the patient's vitals. They ensure precise medication dosing and can alert staff if there are any issues with the IV line, such as blockages or leaks



Pharmaceutical Companies and Digital Therapeutics Startups

Pharmaceutical companies have the medical expertise and resources, while digital therapeutics startups bring innovation and agility. A partnership could result in holistic treatment plans that seamlessly integrate medication with digital interventions like app-based cognitive-behavioral therapy. This synergy could enhance patient engagement, improve adherence rates, and ultimately drive better health outcomes.





The Misadventures in Modernizing Medicine

by Heidi Sahlberg
UX & UI Designer at BeeHealthy/Mehiläinen

Moving from a sleek design firm to the healthcare software sector can be likened to a time traveler stepping a couple of decades back in time. It's a jolt to the system, plunging into an industry where user experience (UX) is a foreign concept, and user research is often afterthought, rather than a starting point.

Creating tools that doctors and other health care professionals find intuitive is not as simple as it sounds. It's not just about what the user interface looks like; it's about understanding their daily tasks, and the systems connecting professionals, patients and other systems. These tools can't be whipped up in the usual bite-sized sprints; they require a marathon of meticulous planning and profound insight into the health care sector.

Simplicity in a Complex System

There are multiple platforms that have managed to simplify doctor-patient interactions, and have even managed to make the user experience really good for the average user. Many health care providers offer chat applications where the patient can quickly get a diagnosis and a medication prescription. There are also online care plans where, for example, a diabetic patient can measure their blood sugar on a daily basis and their health care team can view how they are doing.

However, the simplicity and good UX of these

services are partially due to the fact that they handle straightforward cases without venturing into the gazillion of exceptions and 'what-ifs' that doctors face daily.

Exceptions, too many exceptions

Consider the seemingly simple act of a doctor prescribing antibiotics for a patient. The doctor writes the prescription, the patient picks the medication up from the pharmacy. Easy.

However, outside the cozy confines of the user-friendly interface there is a pile of regulations, and each prescription must also be logged into a national database. From the outside, it sounds like any good design agency can tackle it - it sounds simple enough, just link those two systems, right? Not exactly. From the inside, we understand that the system needs to manage a lot more, as countless exceptions and rare cases can turn a simple link-up into a real puzzle.

A one-time prescription like antibiotics is easy to manage, but it all gets trickier when the prescription is for an undefined time and we want to allow the patient to renew it. Yet some medications are long-term but require monitoring — think anti-depressants, opioids, stimulants — and can't be allowed to be renewed just any time.

And what about when you're prescribed something else than a simple box of pills — like a vaccination or an ointment that the pharmacist mixes for you in the pharmacy? Further, the patient might not always be the app user themselves but their child, or perhaps the user's child who just turned 18 and is technically a legal adult. Sometimes a patient might have started a medication while in the hospital, and needs to continue taking it at home, and that needs to be logged in the database, too.

Imagining a system that will operate seamlessly through this convoluted process is suddenly a lot harder. Even if we as designers can lay out all these options nicely in our doctor's UI, what happens if that structure does not match the system that communicates with the pharmacy? And that is the ordeal only with prescriptions. Similar challenges surround all features, such as referrals for specialists, laboratory sampling and X-ray imaging. Not to mention the reality of everyday work: the X-ray machine in room 2 has been working

“A one-time prescription like antibiotics is easy to manage. But what about when you're prescribed something else than a simple box of pills
Imagining a system that will operate seamlessly through this convoluted process is suddenly a lot harder”

a little poorly lately so we want to use the one in room 1. And nurse Emma needs to pick up her son from daycare at 4 PM so we want to have the imaging done before that.

A design prescription

If I'm the one prescribing now, here's a treatment to get started: there is a need for expertise, transdisciplinary skills, and some sort of collective overhaul of existing systems. Uncoordinated small sprints and little sub-projects, which are often the norm, cannot tackle these challenges. That's the exercise routine a health company should exercise, for short and long term benefits.



CONCLUSION

League players against the body snatchers



Findings highlight the need for innovation that is empathetic, ethically sound, environmentally conscious — and systemically smart.

Concluding this exploration of health and technology in the Nordics, “body snatchers” are not only AI initiatives. Healthcare is one of the most prominent areas of growth in AI and emerging technology in upcoming years, and that comes with opportunities and opportunists.

There are parts interested in data, external businesses eager to disrupt the current ecosystem, there are startups breaking things (and causing real damage), and oligopolies preventing systems to be simplified and better serve patients.

Findings highlight the need for innovation that is not only innovative, but also empathetic, ethically sound, environmentally conscious — and systemically smart.

Health companies think monolithically, when marketplaces and platforms could yield interesting results — a winning “league”.

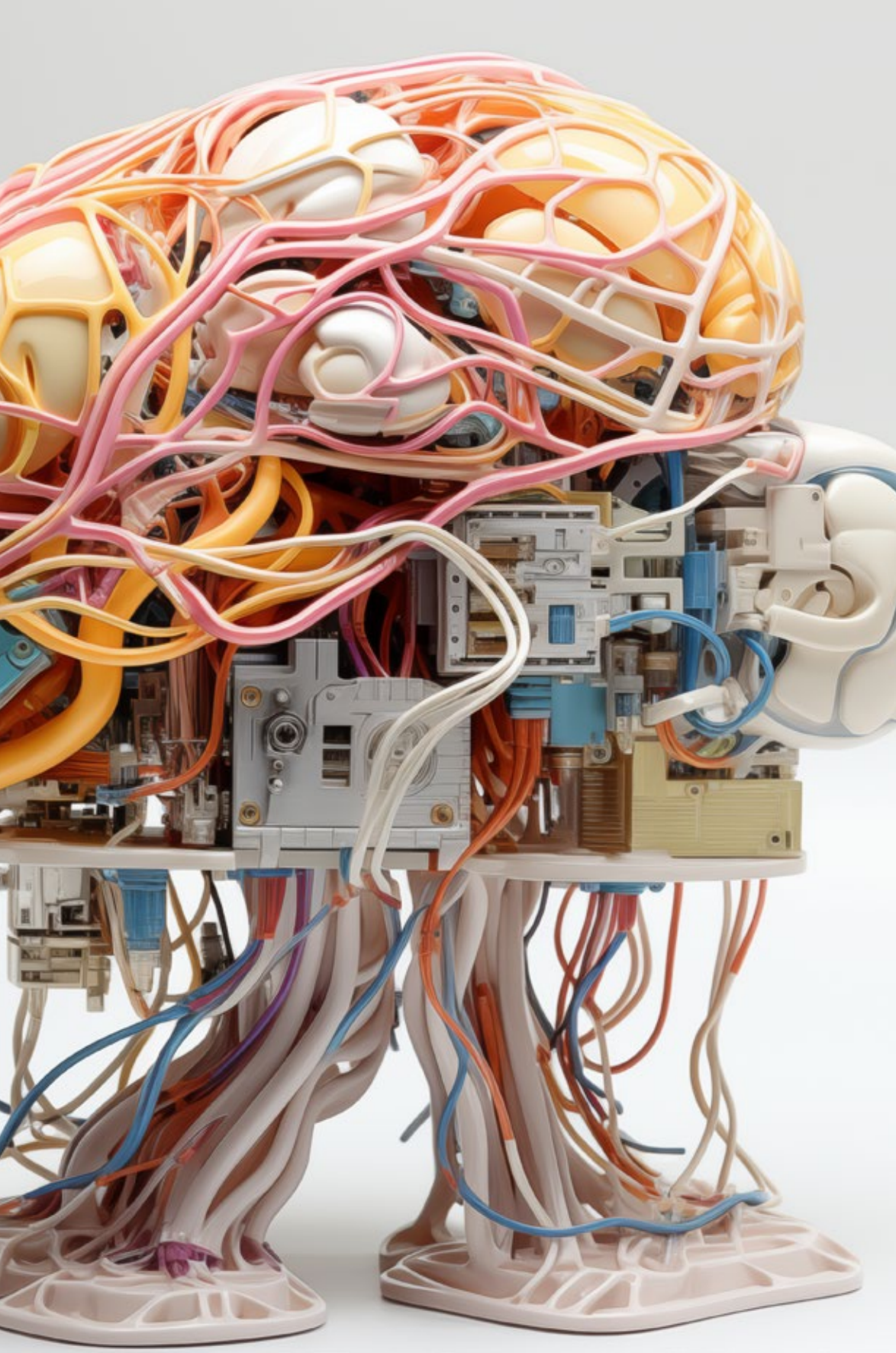
A good example is to think how complex it would be for a company, alone, to integrate nutrition, mental health, physical health, exercise levels, patient progress. On the other hand, the benefits of such integration are

clear, including accelerating data collection for serious scientific research.

Accelerating and accommodating the change from AI, remote care and mental health are immediate concerns.

Remote technology is already prominent, and while efficient, and a new digital literacy of emotions when dealing with health and tech in distance is needed. This also means disruptions in the type of work of health professionals, who may have their day to day significantly impacted by the adoption of new technology changing the fundamentals of patient care and monitoring. Thus, appealing conditions for this new forms of work may be a defining differentiator for employers.

Systems that are simple to integrate and easy to use on both sides of the counter become competitive on both ends: patients, health professionals, and partnerships of extending their services and platforms. Healthcare companies should think of marketplaces instead of monolithic corporations, and consider integration as competitive local advantage to external players interested in the Nordic market.



Special thanks

Special thanks to Jana Pejoska, Jane Vita, Raine Koskimaa, Lev Manovich, Leonardo Custodio, Rui Costa, Jenny Theolin, Matt Wallaert, Jimmy Salerno, Hanna-Riika Roine, Mauricio Manhães, Paolo Cervini, Andreas Markdalen, Per Poulson, Harsh Shah, Emma-Sofie Kukkonen, Mattia Vettorello, Anne Oljelund and many other friends who supported the initiative with heart and generosity — this big thanks was not AI-generated..



BODY SNATCHERS

More on experience foresight — The Nordics — 2024/2034

DRIVE

Perspectives on our caffeine-fueled, sleep-deprived culture of purpose and success

FUTURE SELF

How imagined futures shape the perception of our present and future self

Hygge, drunk pants and fake news

Access to information and systems of belief

Playtime and popcorn

Perspectives on technology and entertainment

HABITAT

A galactic guide for inhabiting spaces

LOVE IN THE TIME OF WIFI

Perspectives on matters of heart and technology