



Futures Intelligence: How to Turn Foresight into Action

Edited by Tuomo Kuosa and Max Stucki

Futures Platform eBook 2021



Table of Contents

Preface	3
Tuomo Kuosa, Max Stucki	
1. Introduction	4
Tuomo Kuosa	
2. Futures Intelligence: Types of Futures Knowledge	8
Tuomo Kuosa, Max Stucki	
3. Understanding the Larger Picture and Path-Dependencies: Trends, Megatrends and Change Drivers	15
Max Stucki	
4. Scenarios: Looking for Alternatives	20
Anna Grabtchak	
5. Horizon Scanning and Vigilance Concerning Changes: Discontinuities, Emerging Issues and Weak Signals	25
Tuomo Kuosa	
6. Wild Cards and Science Fiction: Free Imagination	31
Marianna Mäki-Teeri, Shiori Ota	



Preface

Today, more than ever, decision-making needs well-founded information on how the world changes in the coming times. The future behaviour of trends, the emergence of weak signals and the disruptive unfolding of wild cards all need to be taken into consideration in strategising, risk analysis, planning and innovation to future-proof these processes.

There is a need for information about the future. However, even though the world is filled with data, only careful analysis and packaging can turn seemingly meaningless noise into actionable knowledge. At Futures Platform, we call this type of future-oriented knowledge Futures Intelligence.

Futures Intelligence comes in four basic types, which all provide different types of knowledge addressing different questions: What can be modelled from data, what kinds of alternative futures the seen uncertainties open, what is changing right now, and what is possible in the future? Together, these different types of intelligence help us get a comprehensive overview of the issue at hand. They reveal not only what is probable, plausible and possible and why, but also when – in short, middle or long-term future.

Futures Intelligence covers a range of products designed to fulfil the needs of anyone engaged in actions with significant future consequences. The products are created via a structured process that ensures the validity of information and the robustness of the analysis. They are designed by skilled analysts using tested foresight methodologies and tools. This eBook sheds light on the theory behind Futures Platform's end products, provided content, used methods, and the workflows suggested to the customers and broader audience.

11 March 2021, Helsinki, Finland

Yours sincerely,



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1. Introduction

Tuomo Kuosa

This eBook discusses the types of futures knowledge and the methods to obtain them, which together lay the basis for the four main categories of Futures Intelligence. It contains five chapters written by Futures Platform's futurists, each explaining one category. These chapters were originally published as a special blog series in Futures Platform's Future Proof Blog, and compiled and edited into book format by Dr Tuomo Kuosa and Max Stucki.



Methodology

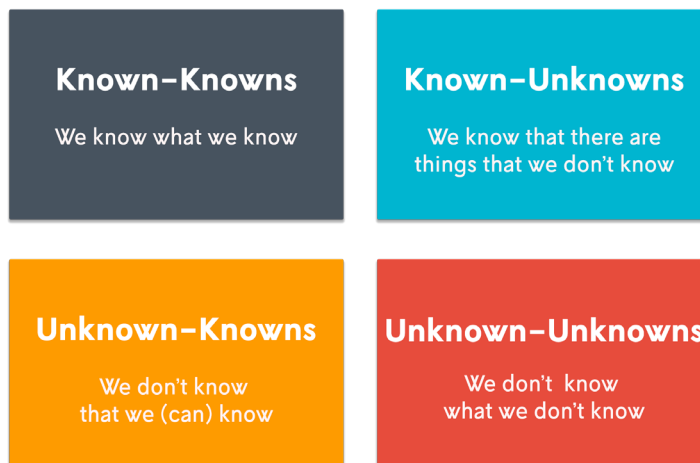
Futures Intelligence as a product aims to guide strategists, decision-makers, planners and innovators on what kind of versatile knowledge they should seek to obtain a comprehensive long-term situational awareness, which is the basis for further strategic capability.

There are two key methodological principles behind Futures Intelligence that should be mentioned here. The first one is **Johari Window**, created by psychologists Joseph Luft and Harrington Ingham in 1955. The methodology was originally used in psychology to help people better understand their relationship with themselves and others. The two axes used in the original version are “Known to self” and “Known to others”. These axes form a matrix with four quadrants: Open or Arena, Blind, Façade, and Unknown.

United States Secretary of Defense [Donald Rumsfeld](#) popularised the Johari Window method in his TV presentation in 2002, where he slightly modified the original technique. His iteration of the methodology has since been adopted to project management, strategic planning and intelligence.

In Rumsfeld’s modification, the focus is not on the relationship between our and others’ knowledge, but rather on mapping what is known and unknown to us. By elevating the focus from the individual to the larger group or society level, Rumsfeld’s modification adapts the method for use cases in national security-related intelligence and futures intelligence.

FIGURE 1
Known and Unknown in Futures Intelligence





Known–Knowns refers to objective facts, such as openly available knowledge or easily calculable quantitative trends.

Unknown–Knowns are things that are too close or familiar for us to see directly. However, it is possible to get a deeper understanding of unknown–knowns through various methodologies, such as emerging issues analysis, weak signals analysis, horizon scanning and other participatory methods.

Known–Unknowns are the uncertainties we are well aware of. For instance, we know that our flight may get cancelled or that AI will affect workforce needs in the long run, but we don't precisely know how. Scenarios and wild cards analysis are the most suitable methods for obtaining this type of knowledge.

There are four quadrants in the Johari Window and four categories of Futures Intelligence. Each category provides valuable knowledge that corresponds to one of the Johari Window quadrants.

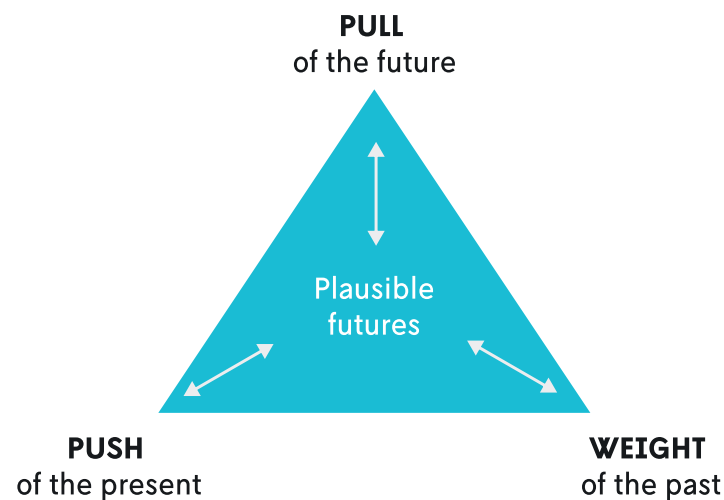
Unknown–Unknowns are the toughest to spot, as they are real blind spots and often outside the scope of our imagination – things that we don't even know we should be aware of or worried about. Unknown–unknowns can be best obtained through visionary methods such as science fiction prototyping, black swan and wild card analysis.

The second methodological principle behind Futures Intelligence is **Futures Triangle**. The original method was developed by Sohail Inayatullah to map the overall situation before a transformative foresight process may begin. The competing dynamics in a Futures Triangle are the past, present and future contexts. Each corner has its own set of trends, drivers and inhibitors, which the users of this method need to list and rank.

In the context of Futures Intelligence, the role of Futures Triangle is not to prepare a setting for transformative space, but simply to map and re-organise data into the three corners of the Futures Triangle and see which power vector dominates in the situation.



FIGURE 2
Futures Triangle



The first corner (Past) of the Triangle concerns the weight of the past and the things that don't change. All bullet points that can be listed on this corner form a power vector that has a certain resistance force. Too often, we tend to focus only on changes when we think of the future. Things that stay or resist the change are equally important. All inhibitors of change, e.g., obstacles, conservative values, infrastructures, investments, legal obligations, and organisational structures, form a resistance force that slows down the development of trends. The first type of Futures Intelligence, **Understanding the larger picture and path-dependencies**, provides items to this corner.

The second corner (Present) concerns pushing factors, such as new legislation, technological breakthroughs, a new competitor or policy, that force things into a new position. All bullet points that can be listed on this corner form a power vector that pushes things forward and makes new things happen. Both the first category of Futures Intelligence, **Understanding the larger picture and path-dependencies**, and the third, **Horizon scanning**, provides items to this corner.

The third corner (Future) is a power vector with a group of things that operate as pulling factors. The things in this corner are wishes, needs, expectations and beliefs concerning the future. The strongest elements in this corner are societal paradigm value shifts, such as fighting climate change becoming the primary societal objective, instead of, for example, fighting communism. The second category of Futures Intelligence, **Scenarios**, and the fourth, **Free Imagination**, play the strongest role in identifying the driving forces that pull us into the future.



2. Futures Intelligence: Types of Futures Knowledge

Tuomo Kuosa, Max Stucki

Futures intelligence is future-related knowledge that informs decision-making, planning, strategy and innovation processes about the coming changes, challenges and opportunities. It is a key component of all successful decision making, strategy work and innovation. It provides its users with analytical knowledge about future changes, trends and their potential impacts.



Futures Intelligence – What is It?

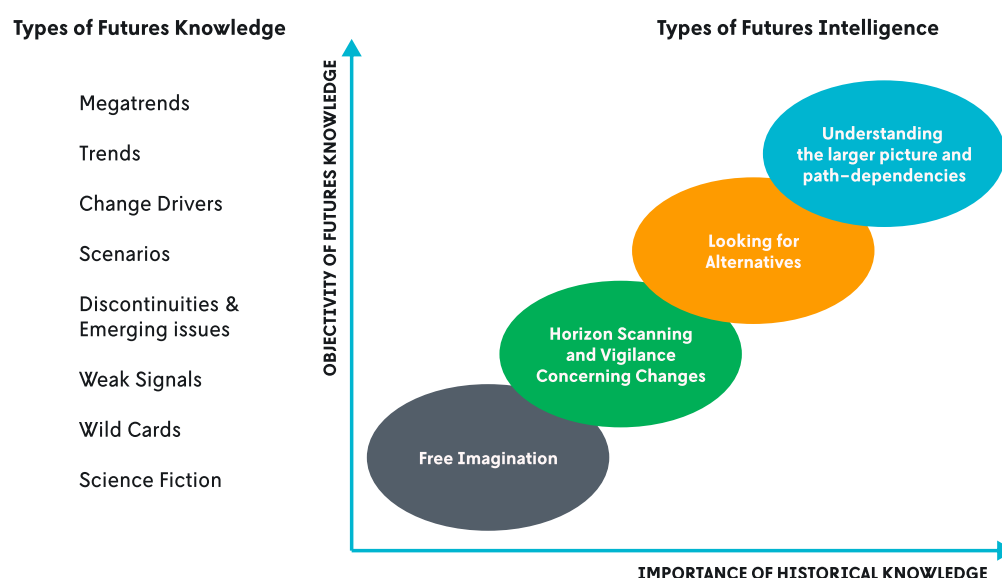
Intelligence, in general, can be understood as useful knowledge derived from otherwise unstructured or unanalysed data. Futures Intelligence, specifically, is future-related knowledge produced for a specific purpose using futures studies and foresight methods. It is usually collected and analysed by trained futurists, and it presents potential future effects and developmental paths in a clear, concise and informative manner.

What sets Futures Intelligence apart from traditional intelligence or business intelligence is that it uses foresight and futures studies methodologies to collect and analyse information. Futures Intelligence aims to assess, forecast, and imagine the various future effects of events, trends, or phenomena. It supports decision-making, strategy, innovation, risk analysis or any other future-related activity. It helps organisations and businesses to achieve goals and ensure their survival amidst unpredictable and challenging environments.

Categories of Futures Intelligence

Futures Intelligence is not a single product. Generally speaking, Futures Intelligence can be divided into four categories, each suitable for a different purpose. Each category is comprised of different types of futures knowledge, which are the basic building blocks of Futures Intelligence. Together, the four categories provide a comprehensive overview of the plausible, probable and possible futures.

FIGURE 3
Types of Futures Knowledge and Intelligence





Megatrends, Trends and Change Drivers

THE FIRST CATEGORY of Futures Intelligence focuses on modelling data into fact-based projections of future developments. It maps known knowns and unknown knowns for further analysis, providing an understanding of the larger picture and path-dependencies related to the subject under study. It comprises of megatrends, trends, and change drivers, which are usually quantifiable. It also aims to map the weights of history, which are things that resist change and keep us where we are.

Megatrends are global, long-term change developments that have impacts on business, economy, and culture on both societal and individual levels. Megatrends are comprised of a multitude of phenomena, and they don't change direction easily. Examples of megatrends include climate change, urbanisation and digitalisation.

Trends have a recognisable developmental path that can be, at least in theory, verified with quantitative data. A current trend is a push of a historical path-dependency, which we believe will continue into the future. Examples of trends include the growth of platform economy, plant-based meat substitutes, and the rising importance of cybersecurity.

Change drivers are either internal or external forces that shape the development of an organisation, a market, a strategy, or a society. Some examples of change drivers are new legislation, new customer needs, technological change, and an emerging need for differentiation due to competition.

Weights of history play a crucial role in understanding the larger picture and path-dependencies. Too often, we tend to focus only on changes; but things that resist change are equally important.

Discover a futurist-curated database of 700+ megatrends, trends and change drivers on Futures Platform

[CLAIM YOUR FREE TRIAL](#)



Scenarios

THE SECOND CATEGORY focuses on providing an understanding of plausible and viable alternatives concerning the subject of interest. This category of Futures Intelligence embraces uncertainties and the known unknowns, which makes it a rather unique type of futures knowledge. It utilises all available knowledge regarding the issue and collides it with a key uncertainty to explore all the plausible ways the future may unfold. The knowledge within this category is most commonly obtained using scenario production methods.

Scenarios are descriptions of the alternative future development paths. They are either plots in the form of narratives or quantitative forecasts in the form of curves. They are not predictions of the future, but they help one explore what could happen and how to prepare for various contingencies.

Discontinuities, Emerging Issues and Weak Signals

THE THIRD CATEGORY goes closest to the more traditional market intelligence as it is about being vigilant concerning the changes in one's environment. Thus, it helps practitioners identify changes as soon as possible. The main focus in this category is on discontinuities, emerging issues, and weak signals of change. In foresight context, this is usually called Horizon Scanning, which is also quite often described as the future knowledge gathering phase, the first stage of a more extensive foresight process.

Discontinuities & emerging issues are strong signals of significant changes in trends or previous developments. Discontinuities can be either expected or unexpected accelerations, slowdowns or total cessations of the known path of developments. Emerging issues are novel things that are just beginning to form and may thus generate something new in the working environment.

Weak signals are early information concerning potential discontinuities and emerging issues, such as new technologies which are still in their infant phase but which may see a breakthrough at some point. They are not yet public knowledge, meaning that only a small group of people are aware of their potential. Weak signals can grow into trends, fade away or appear as early warnings for wild cards.



Wild Cards and Science Fiction

THE FOURTH CATEGORY focuses on possible futures created by free imagination. It frees the mind from the weight and burden of the past to envision a vast multitude of future possibilities. The primary forms of futures knowledge within this category are wild cards, black swans, and science fiction. Science fiction can be entirely fictional, meaning that there are no linkages to the known realities. Yet, it still has a vital role in feeding our creative processes with out-of-the-box descriptions.

Wild cards are speculations of low probability, high impact events. They are based on present issues that are boldly projected onto the future. By nature, they are sudden, rare, unexpected, surprising and disruptive discontinuities and shocks that can be either positive or negative. Some examples of wild cards that became true are the Chernobyl disaster, 9/11, the 2008 financial crisis and the Covid-19 pandemic.

Science Fiction can be pure imagination of the future technological, societal, environmental, political, economic or scientific advances and changes, as well as their implications. Science fiction helps one explore and design the future, spot innovation potential or prepare for various possibilities. It provides out-of-the-box narratives that may become self-realising predictions.

The Uses of Futures Intelligence

The use cases of Futures Intelligence always depend on the organisation's unique needs and context. However, some common themes among these use cases can be identified:

- **Early warnings** alert the organisation about potential threats and opportunities.
- **Informing and future-proofing decisions, plans, and strategies** help the organisation ensure that no important future changes are overlooked when future success is at stake.
- **Thought leadership** on futures thinking boosts the organisation's image, enriches marketing activities and sparks inspiring discussions with potential customers.
- **Innovation** helps the organisation understand and respond to future market needs.
- **Risk analysis** provides an understanding of the potential and emerging risks related to plans, strategies and objectives.



Any decision, plan or process that has significant future-reaching consequences benefits from the application of Futures Intelligence. Otherwise, there is the risk that decisions, plans, and processes are solely based on backwards-looking information, or even only on past, unanalysed data that does not offer insights into potential future consequences, opportunities or threats.

If only past data is used, the picture concerning the future implications of any plan or decision remains deficient, which creates unnecessary and avoidable risks. The more the future is explored, the less unknown unknowns there are.

Producing Futures Intelligence: Futures Intelligence Cycle

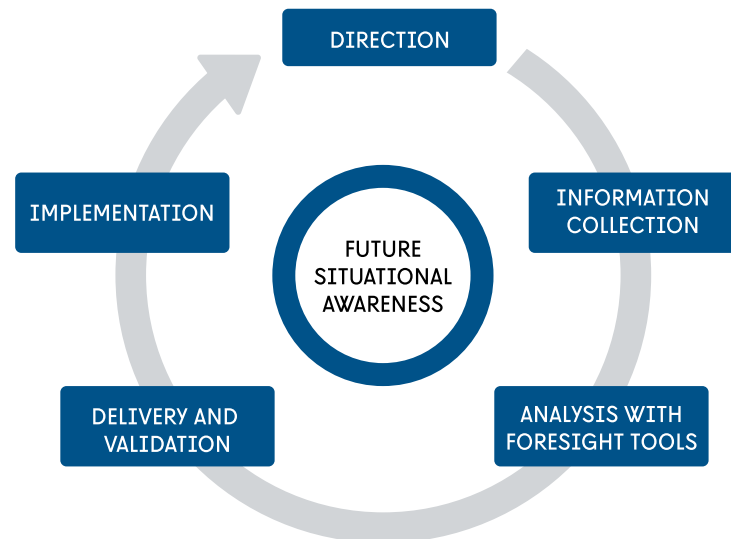
The production and use of Futures Intelligence is a continuous cycle. The cycle is modelled after the traditional intelligence cycle, but it contains futures studies and foresight-related elements that modify it for futures knowledge creation.

Futures Intelligence creation is not always continuous. In some cases, only a deep dive for a specific purpose is needed. The process for the deep dive creation still follows the cycle, however.

In its most advanced form, Futures Intelligence creation is a continuous system that produces high-quality, future-oriented information to all stakeholders and decision-makers. This keeps the Future Situational Awareness of the organisation anchored in the latest developments and enhances awareness of the multiple possible futures one may face.



FIGURE 4
Futures Intelligence Cycle



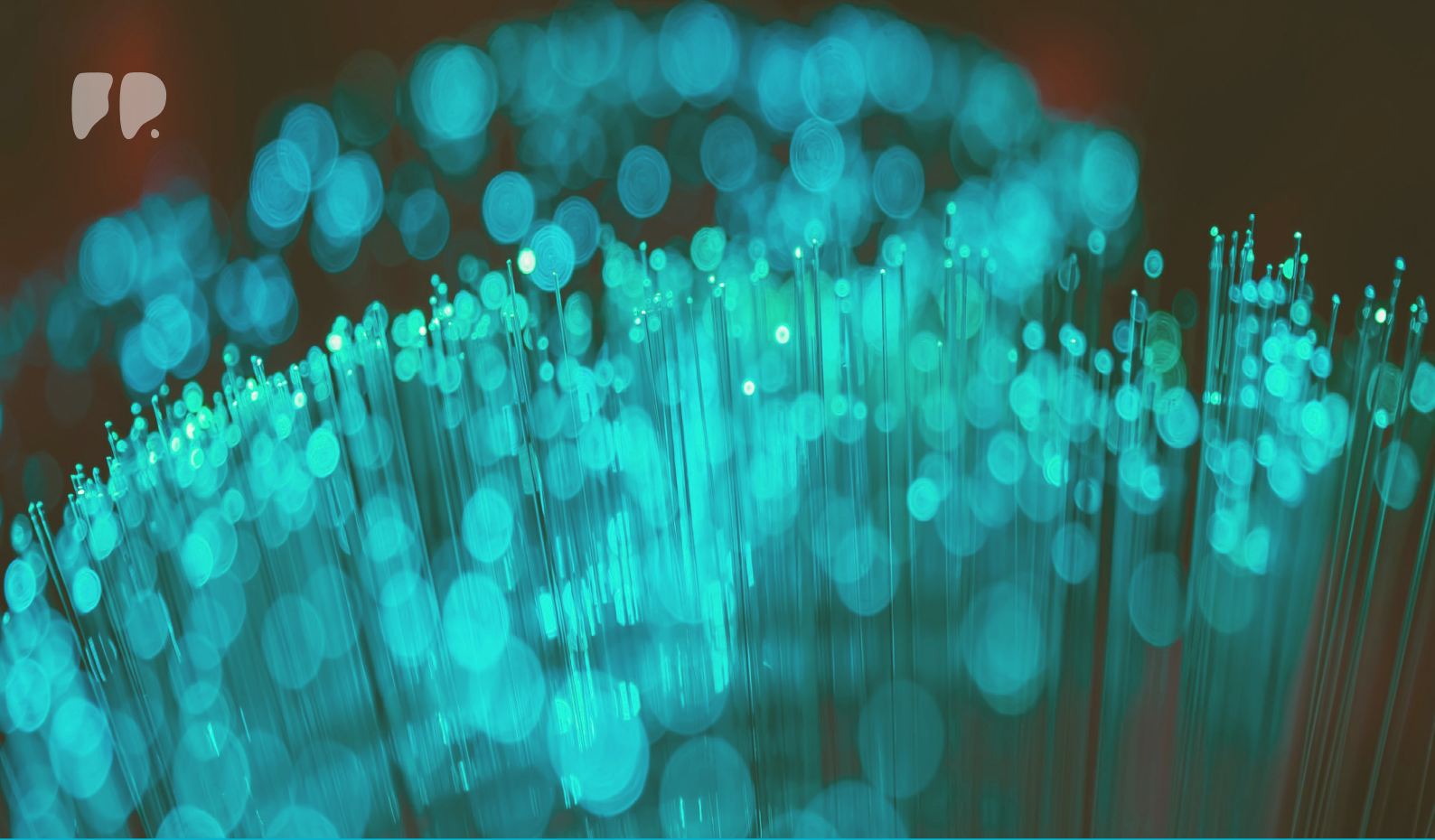
Direction: Futures Intelligence Cycle starts with the needs of the organisation, which direct the futures information collection.

Information Collection: Information is collected using foresight techniques, e.g., horizon scanning or weak signal identification.

Analysis: The collected information is analysed using foresight and futures studies tools, such as trend analysis and wild cards. In Futures Intelligence Cycle, the analysis doesn't only focus on understanding what is happening but also seeks to actively assess the future impacts, consequences and implications of the information.

Delivery and Validation: The analysis turns information into intelligence, which is then packaged and passed to its users who validate its usefulness.

Implementation: In the final stage, Futures Intelligence is implemented to guide various processes, for example, strategy, decision-making, innovation, or planning. The process then starts again with new needs and directions, and feedback from the previous round.



3. Understanding the Larger Picture and Path-Dependencies: Trends, Megatrends and Change Drivers

Max Stucki

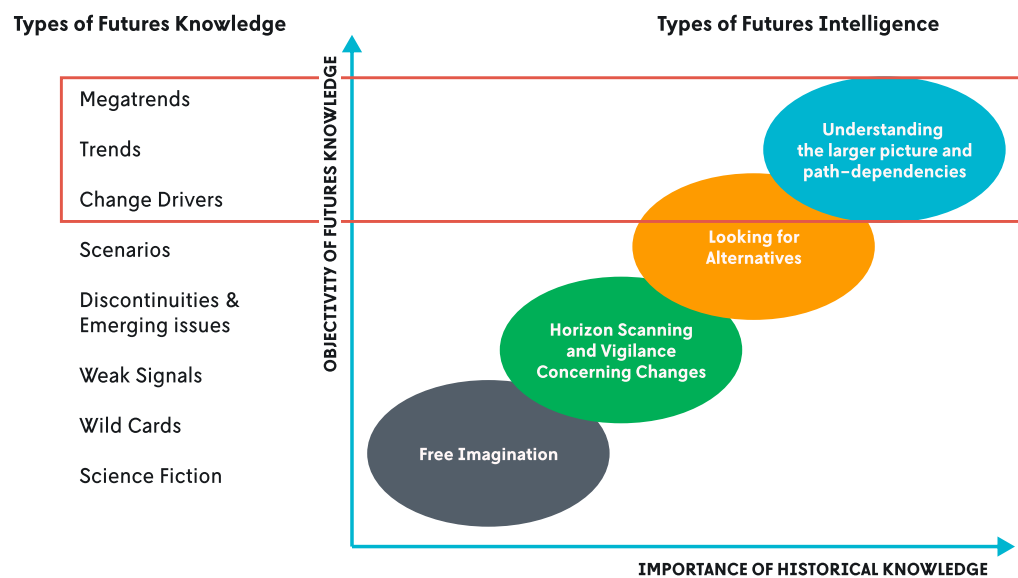
Much of what we can know about the future at the present moment is based on the directions and interactions of megatrends, trends and change drivers. They form the foundation for and are the primary material of Futures Intelligence. Being quantifiable and therefore modelable, they represent the most objective types of futures knowledge.



Megatrends, Trends and Drivers: An Overview

Megatrends, trends and drivers are types of futures knowledge characterised by high objectivity, and they lend themselves to be quantified. In all of them, the weight of historical knowledge is essential as it forms the basis for identifying, modelling and assessing them and their impact. This type of Futures Intelligence mainly provides the known–knowns type of knowledge.

FIGURE 5
Understanding the larger picture – The first type of Futures Intelligence



Megatrends, trends and change drivers all relate to the forecasting, i.e. data modelling type of studying of the future. By doing such quantitative data extrapolation, one can understand the main frame of the current change processes that will affect the future environment. This, together with the knowledge regarding “countering” issues – what stays the same and resists change, forms the basis of the first category of Futures Intelligence – understanding the larger picture and path-dependencies.

Each of the three components, namely megatrends, trends and change drivers, can affect the future on its own. But more often than not, the real effects reveal themselves when these three collide with inhibiting weights of history and impact each other. Such trend collisions can produce opportunities or challenges that have not existed before. The Futures Triangle introduced in the Introduction chapter explains this concept further.



Megatrends – The Big Changes

Megatrends are global, long-term change developments that impact business, economy, and cultures on both individual and societal levels. They are combinations of multiple trends, phenomena and issues that are intertwined with each other.

Synergies are created in the connection points of megatrends. They have a substantial impact on organisations' operational environments, and they shape societies as well. Megatrends push companies to innovate to sustain their market position, and they likewise demand states to anticipate and adapt to the changes they bring.

Examples of megatrends identified by Futures Platform include urbanisation, climate change and ageing of the population.

The changes brought by megatrends generate not only opportunities but also challenges. While many of the opportunities and challenges are not surprising, megatrends' collisions with other trends and megatrends may also lead to unforeseen consequences.

Each megatrend is comprised of smaller sub-trends that drive its development. Megatrends have wide-reaching impacts that can be felt even on a continental level.

Directions of megatrends remain constant for a long time, and they can span over multiple decades. Thus, extrapolating a megatrend's path into the future can be done with reasonable accuracy. However, how the megatrend's effects manifest in particular geographical areas or industries may vary.

Given that megatrends are the foundation of any foresight analysis, relevant megatrends need always be considered when making plans in any organisational setting. For example, if the population is ageing, this needs to be taken into account when planning the launch of a new product line or digitalising public services.

Trends – They are Everywhere

A trend has a recognisable development path that is supported by multiple credible sources. It is a flow of transformations that is not easily redirected. In general, trends can be verified by collecting enough data to form statistics that prove their existence. There are a vast number of trends currently underway. Some of the more prominent examples are the development of the Internet of Things, rising populism in Western countries, and sustainable consumption.



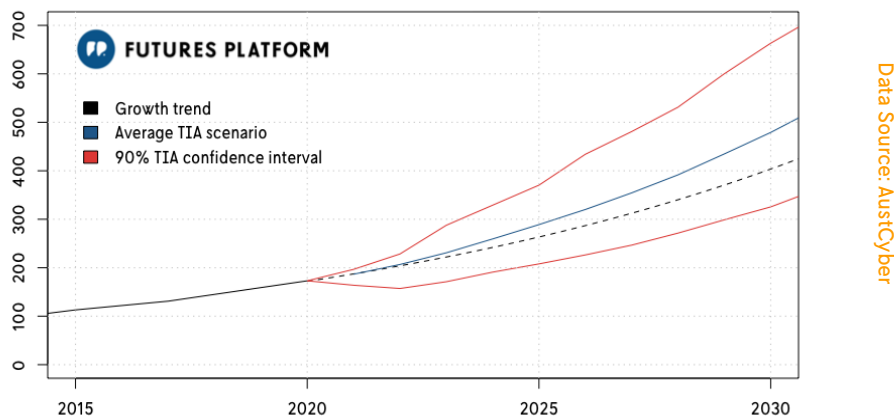
Analysing trends has a significant role in foresight. Trends usually are identified either by using time-series analyses or by experts who are well aware of the latest changes within their fields. For instance, [a fashion trend may be hard to identify from statistics, but it can still be seen on the streets.](#)

Trends and their behaviour become more challenging to predict over a more extended period. Some of the well-known ways to analyse trends are [Trend Impact Analysis](#), trend extrapolation, and [S-curve analysis](#).

Trend Impact Analysis focuses on identifying the sub-trends of a larger trend and analyses the impact of each sub-trend either separately or combined with the primary trend.

FIGURE 6

Trend Impact Analysis: Global Cybersecurity Spending, billion US\$



Trend extrapolation, at its core, is pure forecasting or data modelling. It directly extrapolates the past data points, i.e., development shown in a past or present time-series, into the future. In other words, it answers the question of “What if this development continues into the future without any changes?”. It is based quite often on the Ceteris Paribus principle, meaning that only one trend and its impacts are at the focus, and all other impacting factors and trends are left out of the calculation.

S-curve analysis is based on understanding the nature of trends and their development over time. Trends are usually S-curves: They start with a modest pace, and after a while, they rapidly accelerate until the trend reaches its full potential, followed by a slower pace of growth or stagnation.



Trend analysis can yield important insights into the future of various markets, social transformations, technological developments or political changes. Understanding how a trend might develop in the future lets one also think about the trend's possible collisions with other trends.

Trend collisions usually disrupt the existing status quo in markets and societies, creating the most fertile ground for new products and services.

Change Drivers – Pushing the Development

Change drivers are internal or external forces that either pull or push the change forward to shape organisations, societies and markets. All trends can be drivers. What differentiates drivers from trends is that trends must have a history, whereas drivers can basically come from nowhere and immediately start pushing things into a new order.

The main areas from which drivers emerge are [new technological developments](#), [government regulations](#), [value changes and competition](#). For example, a change in legislation or a government decision to support or tax a certain economic activity are powerful drivers that can shape an entire industry within a country.

In foresight, understanding the main driving forces that affect the flow of events is central. Any actor engaged in foresight needs to consider the main driving forces impacting the research question they are studying. Also, it is vital to consider the potential influence the drivers may have on each other.



4. Scenarios: Looking for Alternatives

Anna Grabtchak

When thinking about studying the future, it is easy to get stuck into pure forecasting activities which only extrapolate the current trends. Scenarios expand the time horizon, aid in looking beyond the usual extrapolations and improve thinking about the potential unexpected developments. Being descriptions of possible, probable or preferable futures, they help organisations plan and prepare for various contingencies.



Futures – Not a Single Future

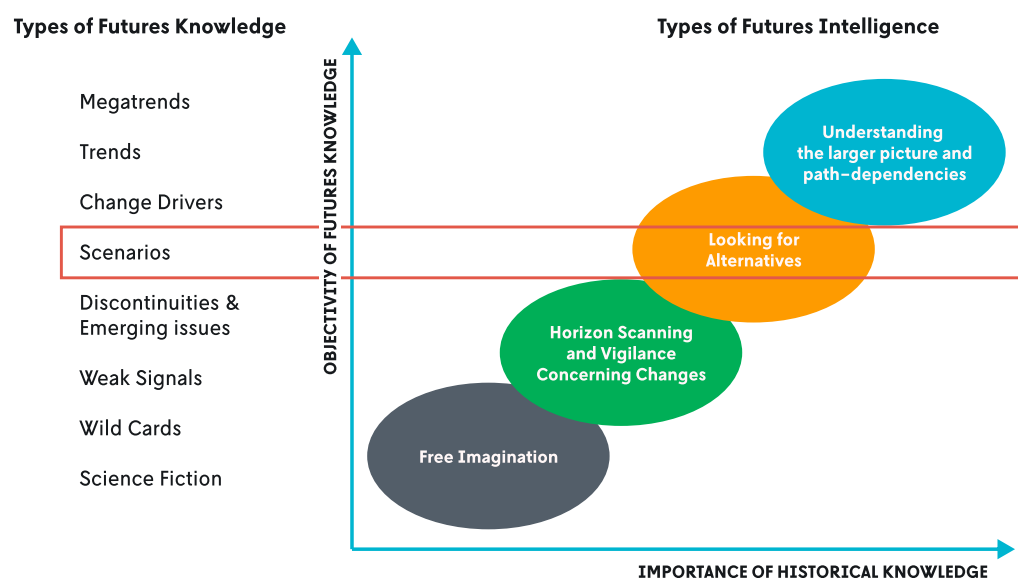
Future is not predictable because it is not predetermined. We can influence it and build a preferable future through our choices; but to be able to understand where the choices we make today might lead us years later, we need to map the changes in our environment to form an understanding of their potential and formulate our plans based on this understanding.

By changing the perception of a single, fixed future towards multiple futures, the organisational understanding of a singular path of development is broken into several future options. [Scenario building represents one method for conducting foresight activities that help us understand and describe our future as a plural.](#)

Scenario work first scans all available knowledge regarding the issue under study, and then collides this body of knowledge with one specified uncertainty or known unknown. By mapping out the potential possibilities, it concretises alternative futures and forms well-founded but still imaginative descriptions of what could come to pass.

FIGURE 7

Looking for alternatives – The second type of Futures Intelligence





Scenarios – What?

Scenarios were created to overcome the limitations of pure forecasting. Whereas forecasting can extrapolate the future course of existing trends, it fails to take into account the various uncertainties and known unknowns that could take place if trends change directions, collide with other trends, or if the developments become disrupted by improbable events.

The term scenario has its origins in the world of cinema. Scenario work has retained its original context's requirement for a vivid imagination and the use of intuitive logic.

As a methodology, scenarios combine robust facts with imaginative projections of their future developments and interlinkages. The need for scenario work arises from the need to prepare for potential changes in one's environment. As these changes are usually shaped by several (surprising) uncertainties, they cannot be deduced from direct trend projections.

Scenarios can take into account things that are hard to put into numbers, or whose probabilities are low. [In organisations, scenario work enables the creation of mutual images of potential developments](#), thus helping to form a shared understanding of relevant issues, threats, and opportunities between individuals.

Strategy Work – Benefits?

When moving the focus from predicting one possible future to mapping various alternative futures, we end up in a complex situation where we need to manage multiple evermoving targets instead of one. The logical question arises: How to conduct strategy work if you must manage multiple images of futures?

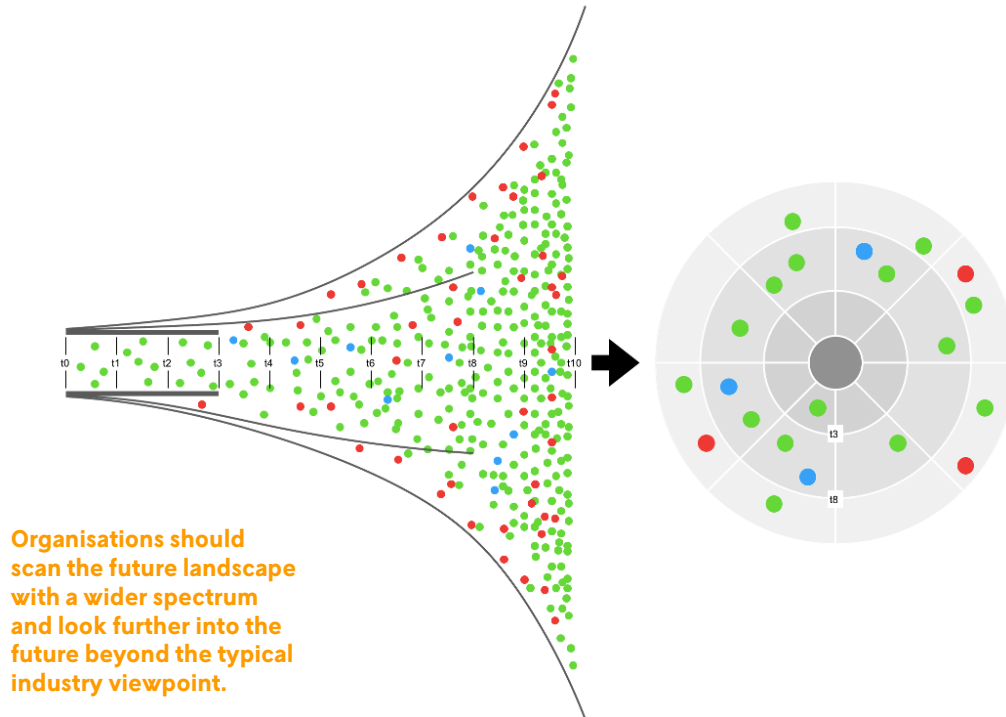
In this case, mapping the images of probable, plausible and possible futures could be the minimum recommendation. These images are based on information about phenomena that are changing both the immediate operational environment of the organisation as well as the more distant issues that could affect its future.

You can categorise and map phenomena in your operational environment, for example, based on their timeframes: immediate future (1–3 years), medium-term (4–6 years), and long-term (7–9 years and beyond).



FIGURE 8

Funnel of Probable, Plausible and Possible Changes



Scenarios – How To?

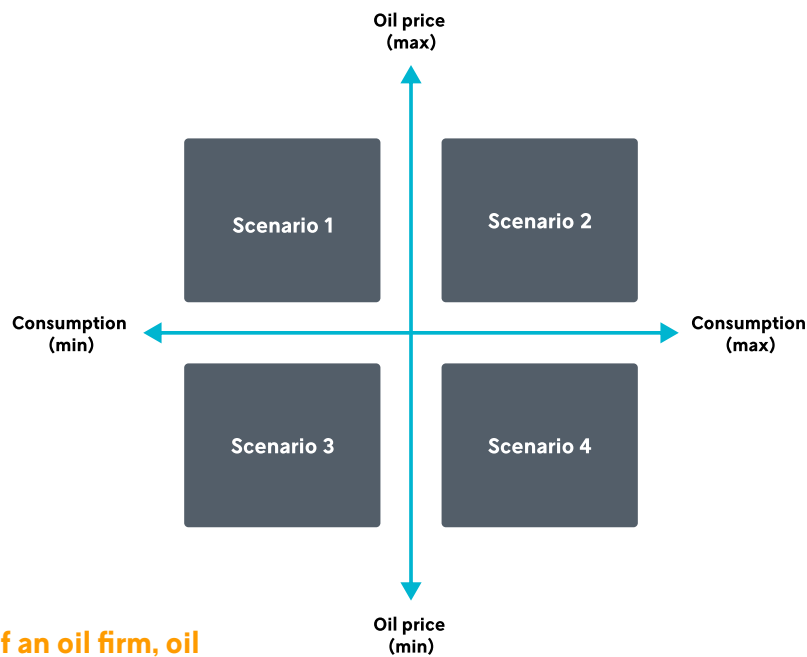
There are various different approaches to scenario-building. Below, we outline the main steps involved in Futures Platform's scenario workflow.

- 1. Defining The Topics:** First, define the main themes and topics you want to reflect in your scenario work and set them as your radar sectors. You can also use existing frameworks, such as [PESTLE](#). At this point, also determine the year you will be describing in your scenarios, e.g., 2030.
- 2. Horizon Scanning:** Scan for strengthening trends that can be verified from trustworthy sources and are relevant to your organisation. Also, search for wild cards, weakening trends, weak signals to ensure diversity in your environmental description. Add these on your radar.
- 3. Voting and Rating:** To form a comprehensive picture of your findings during the horizon scanning phase, involve your organisation's members and ask a selected team to vote for the important trends and signals. Rate the content according to specified criteria (for example, the level of uncertainty and threat) to find out the most uncertain and threatening trends and signals.



- 4. Building the Scenarios:** Define two axes that describe the core assumption that forms the very foundation of your business logic. Use them to create a simple 2x2 matrix. Select the top 4–6 most uncertain trends (part of results in step 3) and describe their different development options in each of the four boxes that would be formed in the matrix between the two axes.

FIGURE 9
Scenario Axes



In the case of an oil firm, oil price and consumption are the two key uncertainties to investigate, as they relate to demand and profitability.

Create Organisational Preparedness with Scenarios

Remember that, in scenario building, you don't need to predefine or forecast future events. Even if none of the scenarios happen just as described, your strategy work now involves an inbuilt activity that creates flexibility, agility and helps you see the opportunities in future changes. Once the scenario work is in place, you only need to decide how to utilise and test the ideas explored during scenario work in practice.

After conducting scenario building activities, your organisation will be more alert and prepared for future changes. The work itself creates a mutual understanding of what futures could look like and what potential disruptors you may be facing.



5. Horizon Scanning and Vigilance Concerning Changes: Discontinuities, Emerging Issues and Weak Signals

Tuomo Kuosa

Horizon scanning is the phase of gathering future-related knowledge, which is the first stage of the larger foresight process. It is about being vigilant concerning the changes in one's environment; focusing primarily on discontinuities, emerging issues, and weak signals of change. This third category of Futures Intelligence goes closest to traditional market and business intelligence. It is a crucial phase in any foresight activity, as it provides comprehensive overview of all future-relevant changes around the subject of study.



Horizon Scanning and Being Vigilant – An Overview

The value of horizon scanning increases in an increasingly volatile, uncertain, complex and ambiguous VUCA world. The main objective of horizon scanning is to be vigilant concerning changes by identifying discontinuities, emerging issues and other signals of change. This type of intelligence mainly provides unknown–knowns type of insights, as discussed in the Introduction chapter.

Another primary goal is to get a comprehensive futures-oriented overview of the topic at hand. To achieve this, gathering other forms of impactful futures knowledge, such as social and technological phenomena, trend-based knowledge, drivers, scenarios, and wild cards, is highly important.

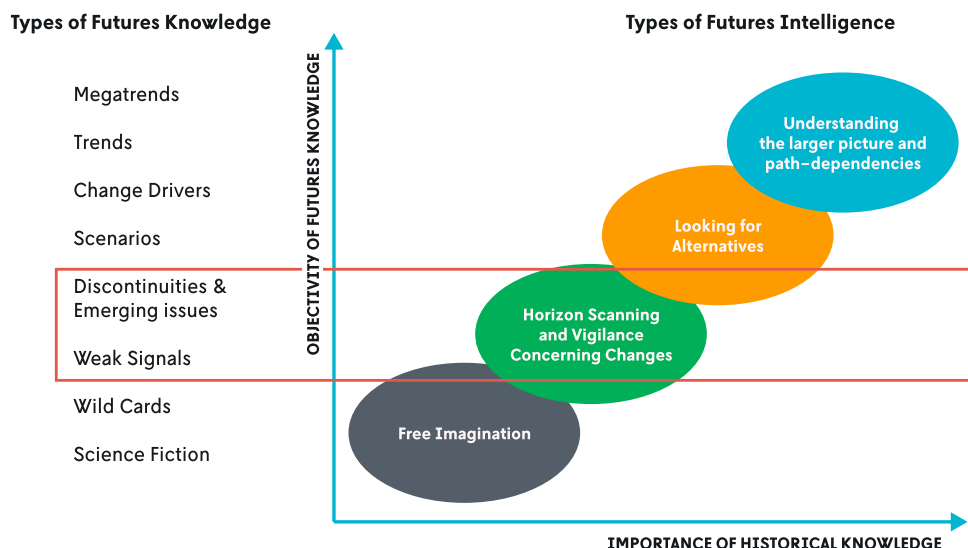
As shown in Figure 10, horizon scanning and vigilance concerning changes rely little on analysing historical knowledge. They focus instead on the present time, providing discoveries, intelligence or changing stats.

This third category of Futures Intelligence is also relatively low in objectivity. This is because horizon scanning primarily seeks to gather knowledge on novel changes in social phenomena, which are quite often ambiguous by nature.

Finding any relevant knowledge about such phenomena changes, or even about their existence and boundaries so that they could be named in the first place, requires qualitative analysis, reasoning, falsification and concluding, all of which are prone to subjective thinking.

FIGURE 10

Horizon Scanning – The Third Type of Futures Intelligence





Discontinuities

Discontinuities are changes in trends, which can be, for example, previously seen developments in social or technological phenomena. They are culminations, breaks, or decisive turning points at which a significant historical event or change occurs.

Discontinuities can be either expected or unexpected accelerations, slowdowns or total cessations of the known path of developments. In most cases, they cannot be forecasted from historical knowledge, except for mathematical modelling of, e.g., bifurcation or avalanche point.

On the contrary, discontinuities can usually be reasoned only by humans, and hypotheses of potential discontinuities can be analysed, for example, with trend development models and confidence intervals in mathematical trend–extrapolations.

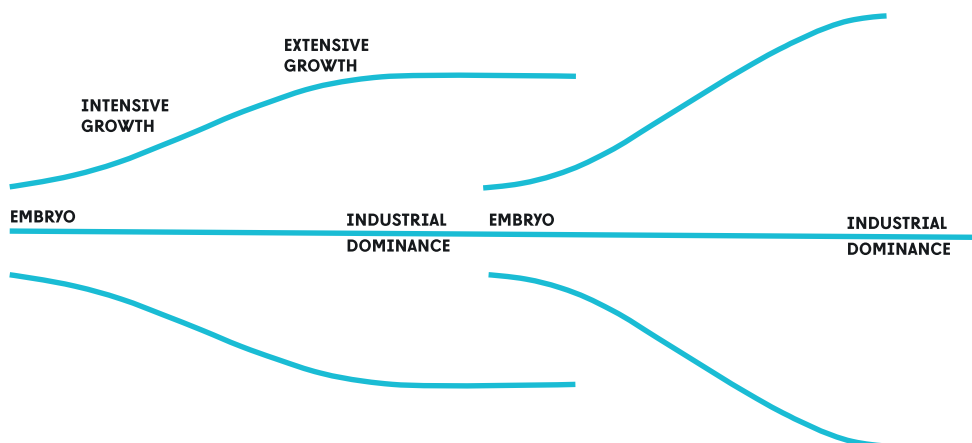
Emerging Issues

Emerging issues are novel things that are just beginning to form, potentially driving change in the working environment. They are new by definition, meaning that they don't have history. Emerging issues may also be called embryos, seeds of change, infant, incubating or germinating issues or phenomena.

According to futurist Pentti Malaska's funnel model, there is always a dominant mode of production in the market. It is first in an extensive growth phase, meaning that all suppliers can flourish as there is more demand than supply.

FIGURE 11

Pentti Malaska's Funnel Model





At some point, the growing market starts to get saturated, and the competition intensifies. Suppliers start looking for new ways to differentiate, urging them to become more productive.

The answer to this is a new technology or production mode, an “embryo” that is very small, weak and unknown at the beginning. Once this new embryo proves profitable to businesses, it becomes attractive to the market.

Next, this embryo or emerging issue starts to obtain investments and generate new business models until it becomes the new dominant production mode, leaving the former dominant production mode in its shadow.

Malaska’s model discusses such macro-level paradigm shifts in production modes of the market. But the same logic applies to smaller-scale shifts as well. There can even be several emerging issues competing simultaneously within the same system.

Both discontinuities and emerging issues are more or less surprising changes in the course of the prevailing development. Neither can usually be calculated solely from historical knowledge. The difference between these two is that emerging issues are novel things without previous history, while seemingly similar discontinuities may recur in time.

Weak Signals, Strong Signals and Phenomena

Weak signals are early signs of potential discontinuities and emerging issues, such as new technologies that are still in the infant phase.

They are not public knowledge yet, meaning that only a small group of people are aware of their potential. When media and the larger public become aware of a weak signal, they turn into strong signals. Both weak and strong signals may grow into trends or drivers, fade away, or act as early warnings to wild cards.

Besides the most impactful discontinuities, emerging issues and weak signals, horizon scanning also seeks to identify and prioritise other types of phenomena that are highly important for understanding the issue under study. These other phenomena may cover, for example, various types of trend-based knowledge, drivers, scenarios and wild cards. This second objective of horizon scanning is essentially what we call comprehensive futures intelligence.

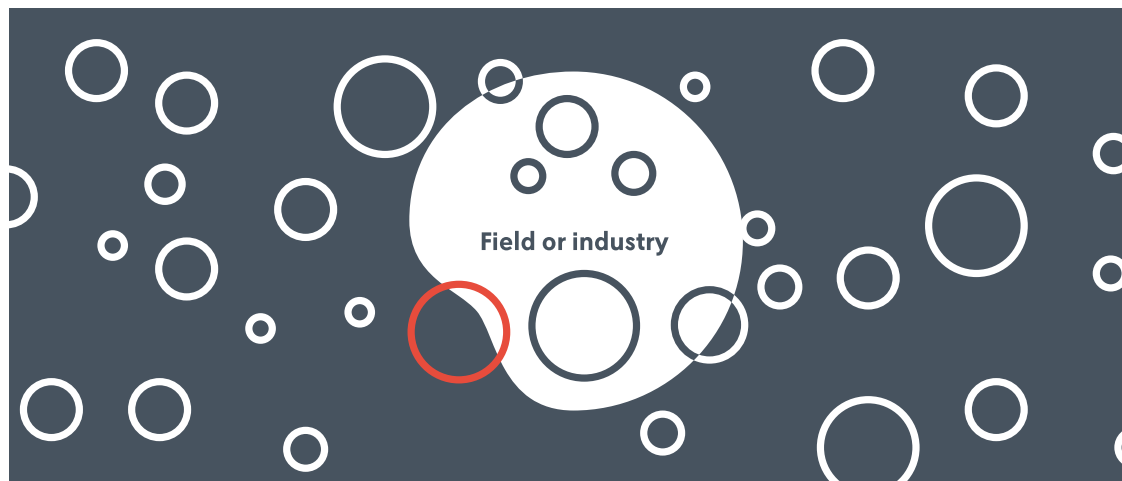


Horizon Scanning in Practice

Figure 12 illustrates the concept of horizon scanning: The white area is one's field or industry which one usually knows well. The circles within this area are changes that are in the process of being formed. The bigger the circle, the bigger of a driver of change or discontinuity it is. The middle-sized circles are a bit smaller discontinuities or larger emerging issues, whereas the small circles are weak signals, strong signals or very early stage emerging issues.

FIGURE 12

Horizon Scanning



Some changes, discontinuities and emerging issues in the field or industry are endogenous, but usually, most of the truly impactful changes first emerge somewhere else.

At any given time, there are thousands, or even tens of thousands, emerging issues out there, the existence of which is not yet known to the larger public. The smaller group of emerging issues, those that are publicly discussed, are still so numerous that one can't be possibly aware of all of them.

A signal that first appears very small and distant, such as the Covid-19 virus that was initially considered a minor medical issue in China, may quickly grow into a big driver with significant global, cross-industry impacts. The red circle in Figure 12 represents this stage.



Benefits of Horizon Scanning for Organisations

Future is continually in flux. The changes happening today are reflected in the changing environment of the future. By remaining vigilant of the present changes, organisations can prepare for multiple future scenarios and seize innovation opportunities ahead of time.

Horizon scanning helps organisations navigate the VUCA world confidently. It provides a comprehensive, systematic and long-term overview of all impactful futures knowledge in one's operating environment and gives organisations the agility to continuously assess risks, opportunities and accordingly re-prioritise.

If organisations rely only on historical data, the understanding of future implications of any plan or decision remains deficient, leading to avoidable risks and lost opportunities. The more the future is explored, the less unknown unknowns there are.



6. Wild Cards and Science Fiction: Free Imagination

Marianna Mäki-Teeri, Shiori Ota

Wild cards and science fiction are key foresight components that enrich our imagination and understanding of possible futures. As uncertainty about the future increases, wild cards and science fiction are gaining popularity among various organisations to foster future preparedness and visionary thinking. Exploring possible futures supported by free imagination is a cornerstone of versatile foresight practice.

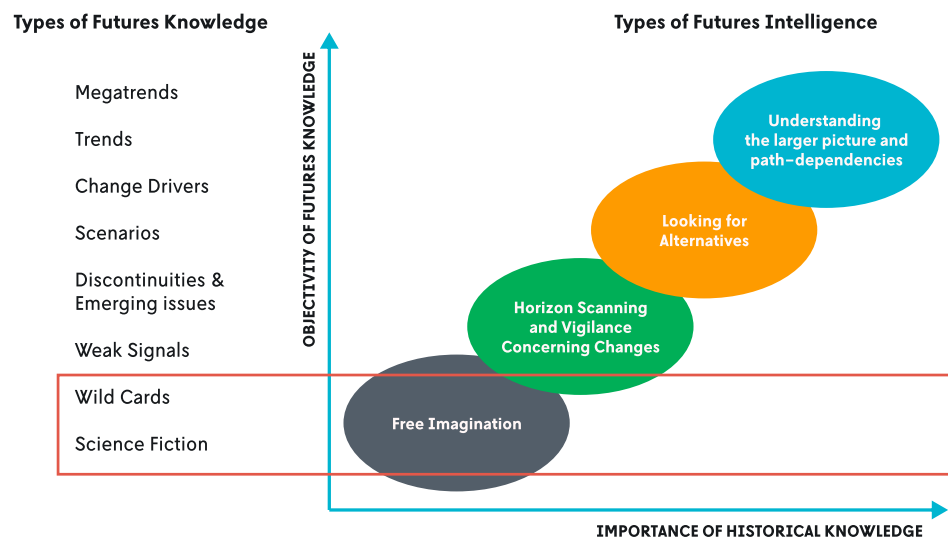


Wildcards and Science Fiction: An Overview

Science fiction and wild cards are the lowest in objectivity among all the other futures knowledge since they rely less on historical knowledge. The key reason to explore possible futures with the help of free imagination originates from the fact that the future doesn't exist yet. Secondly, there are various unknown-unknowns out there. Getting at least some kind of understanding of them would be very beneficial for any strategic planner.

FIGURE 13

Free Imagination – The Fourth Type of Futures Intelligence



By utilising a mixture of original and imaginative thinking, [creativity-based foresight methods](#) can help us expand our thinking beyond the probable futures, which are often studied on the basis of quantified historical data and trend extrapolations.

The future hasn't happened yet, which means there is an opportunity to design it – our visions and decisions can shape it. Wild cards and science fiction can improve our capacity to imagine and navigate towards preferable futures, while also helping us to prepare for future events that are more sudden, rare and negative by nature. This set of visionary futures knowledge provides the fourth category of Futures Intelligence – the Free Imagination.

The ability to detect and understand significant developments that can challenge the status quo is increasingly becoming a key competitive advantage in [the VUCA world](#). While anticipating unexpected events can be challenging, wild cards and science fiction can encourage and help us envision what developments or changes may shape the future, as well as their potential opportunities and risks.



Wildcards – “Known Unknowns”

Wild cards are often characterised as sudden, rare, surprising and disruptive discontinuities and shocks that could change the course of the future. They are changes and events that have a low probability of occurrence; but if they do occur, their impacts are significant and even radical.

The terms “wild cards” and “black swans” are often used interchangeably. However, there is a division between wild cards as “known unknowns” and black swans as “unknown unknowns”, as discussed in the Johari Window section of the Introduction chapter. Rare, unknowable, and completely unexpected (nearly 0% probability) future events that no expert is aware of are considered black swans. On the other hand, it can be debated whether some events, such as 9/11, happened completely unexpectedly with no signals, or they just remained ignored and thus seemed “unknown” but were considered predictable in retrospect.

Wild cards can have global and local implications, which can be positive, negative, or both. They can shake the landscape of “future reality” and challenge the core of who we are, our hopes, fears and expectations. As they can occur and move fast, it is not always possible to prepare for them, but continuous foresight efforts can make a considerable difference.

As we tend to ignore or undermine highly improbable things, our pre-assumptions make it difficult to identify wild cards. Thus, creative thinking can help familiarise organisations with the idea that future holds discontinuities and rapid, high impact events.

Wild cards are events that we know may happen based on existing knowledge. For example, [Futures Platform's futurists](#), and many other experts, warned about the possibility of a pandemic well before the Covid-19 outbreak.

The ideas about “known unknowns” and “unknown unknowns” can be valuable when testing the preparedness of systems and businesses against wild cards and considering possible actions. As the coronavirus pandemic has shown the potential impacts of wild cards on the entire world, wild cards may be taken more seriously in many organisations from now on.

To design systems as robust and future-proof as possible, a comprehensive process of identifying, analysing, and monitoring is required. [For example, continuous monitoring of weak signals can provide clues of wild cards.](#) Using multiple approaches and methods can provide useful information on strong and weak signals, on short-term and long-term, as well as preferable to possible changes.



Science Fiction – Out of Box Narratives

Science fiction can be pure imagination of the future technological, societal, environmental, political, economic changes, scientific advances, and their implications. It provides out-of-the-box and visionary narratives that may become self-realising predictions and prove useful when generating new concepts, schemes, products, and services. Especially sci-fi books, films, and series have been instrumental in this.

In foresight, science fiction prototyping is one of the practical methods that can be used to reframe and expand our perspectives and to invent or innovate the future. [Science fiction prototyping refers to an imaginative short story based explicitly on a science fact to explore its potential future developments, consequences and implications.](#)

Science fiction prototyping often involves highly detailed scenario building with vivid narrative, specific settings, action sequences, and characters set in the form of stories. The methodology's focus is to introduce innovations into wider fields ranging from business to science and socio-political systems. Professionals from various backgrounds can use science fiction prototyping to explore a wide variety of futures.

Science fiction can significantly influence technological innovation and scientific research. [Many current and emerging technologies such as flying cars, GPS, mobile communicators, robot friends, and teleportation have their roots in science fiction.](#)

However, good science fiction should explore more than just the technological and scientific field. This means that it also should focus on social, cultural, economic, political, psychological, ethical, and environmental dimensions emerging from humans' varied interactions with technology, as technological developments take place in parallel with the changes in socio-cultural practices.

There are multiple reasons why the field of foresight is taking a further interest in science fiction. For example, it can be used [when introducing novel technologies, assessing weak signals or black swans, and studying the social impacts of technologies.](#) It also opens up an opportunity to envision and prototype very complex socio-economic and political systems of the future. Furthermore, science fiction narratives can also shed light on the “unknown-unknowns” domain of knowledge. From the point of view of the Futures Triangle, the role of sci-fi and other visionary methods is in framing the pull of the future factors, such as wishes, needs, expectations and beliefs.



The use of science fiction can also bring significant benefits to [business innovation](#). It can empower organisations to challenge their status-quo thinking and spark innovative ideas. Ambitious organisations consider science fiction invaluable; tech giants such as [Google, Microsoft, and Apple have employed science fiction writers as consultants](#).

Science Fiction and Visionary Methods Improve Future Preparedness

In the face of an uncertain and turbulent world, operational environments are ever-shifting. Thus, it is vital to conduct continuous monitoring and ad hoc analyses of future opportunities and risks to reduce the level of uncertainty and pave the way for a built-in foresight capability.

Research has shown that future-prepared firms outperform [the average by a 33% higher profitability and a 200% higher growth rate](#). Futures thinking has several benefits that go beyond improved performance numbers, such as [fostering stronger organisational collaboration, curiosity and co-creation to enable new, innovative solutions and better ways of doing things](#).

Since the low probability of occurrence doesn't mean non-existent probability, it is becoming ever-more important to incorporate wild cards into foresight work.



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