

HORIZON SCANNING

TIPS & TRICKS

**A PRACTICAL
GUIDE**



European
Environment
Agency



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'Grassroots horizon scanning: guidance on how to conduct and communicate the results of a systematic horizon scan with limited resources'

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I. Why Horizon Scanning?

The future is highly uncertain and complex. With Horizon Scanning, a Foresight method, we can capture, make sense of existing signals and assess the importance of emerging issues to help us build resilience to future shocks, surprises, and uncertainty. This practical guide aims to inspire and support Eionet member countries interested in strengthening their Horizon Scanning capabilities. It offers simple, step-by-step guidance on how to frame, run, analyse and communicate the results of a systematic horizon scan with limited resources. The guide is suitable for practitioners from different professional backgrounds and levels of experience in Horizon Scanning. It proposes various methods that can be conducted by and for diverse stakeholders without the need for a dedicated budget or expensive tools. For this reason, no automated, advanced tools (which are usually costly) or time resource intensive process options for humans were included in the guide.

II. How to use this guide

This document provides guidance on how to conduct a structured horizon scanning process to identify and to make sense of those weak signals that could have potential impact on the future, and in particular on the environment. The guide starts describing why there is a need for foresight by introducing firstly, the concept of Futures Literacy and its connection to the practice of Horizon Scanning, secondly, it presents three concepts around a *Futures Mindset*, which is essential to conduct Horizon Scanning. In the main part, this guide provides a step-by-step approach on how to conduct a structured Horizon Scanning process, including plenty of diverse sources to spot signals, three frameworks for signal scanning and several options to unpack and analyse the collected signals and patterns of change through creative methods and exercises. Then, it proposes a few different and complementary ways of communicating your findings to your networks and communities. Lastly, it suggests some tools you can use to strengthen the scanning process. In the Annex, you will find a detailed comparison of such tools, a glossary for all terms related to the Futures Literacy field, as well as templates you can use for each step of the scanning guide.

III. Horizon Scanning for Europe's environment and environmental policy.

Although the year 2020 has mainly been shaped by the Covid-19 pandemic, humanity will face several other crises within the next decade. These include the natural crisis characterised by the threats of climate change, loss of biodiversity, and overuse of natural resources. Further, the interhuman crisis: as we live in times where we have never been so connected through virtual and digital spaces, but simultaneously have to fight the increase of mental health issues and domestic violence. Lastly, the policy crisis, where we have to redefine democracy and the pathways within our voting and governance systems. As with the global Covid-19 pandemic, we have to face all of these crises and take action today to shape a better tomorrow.

The future of Europe's environment and sustainability is likely to be highly influenced by such crises and developments of societal, technological, economic, environmental and geopolitical natures and changes in values and lifestyles. These drivers of change differ from each other concerning their origin, nature, likelihood, significance, geographical scale and timescale. Although some of them are well established and well known, some have just emerged, and their effects have not yet unfolded or are still unknown. This is the case of emerging issues and trends, which represent emerging developments of which potential implications are not well understood. Foresight methods and Futures Thinking can support the decision-making process in the present to transform into the future with purpose and long-term thinking.

Horizon Scanning tries to detect early weak signals that could lead to changes in behaviour, strategy or policy. Horizon scanning processes can help decision-makers take a longer-term strategic view and make present choices more resilient to future shocks, surprises, and uncertainty, and take proactive actions as early as possible.

IV. Horizon Scanning vs Environmental Scanning

Horizon Scanning and Environmental Scanning are methods used to identify changes in the past, present and future. Environmental Scanning focuses on current developments usually by investigating changes in the STEEP (social, technological, economic, environmental, and political) categories.[1] Horizon Scanning tries to identify early rising weak signals that may evolve into emerging issues in the future but are not yet present in current-day research or media. Those emerging issues can then convert into trends over time, possibly with transformative consequences, or disappear without further notice (see the glossary in the annex for definitions). Thereby the process expands our thinking beyond today's events to the future.

In other words, Environmental Scanning helps us understand the present and what is already visible by analysing data or pieces of information that already exists, hence is manifested in the past.[2] In contrast, Horizon Scanning challenges these norms and our current images of the future by identifying and provoking change. Horizon Scanning needs to search beyond the mainstream fields or "outside the box" to identify new resources. This may include new references from the arts, pop-culture, science-fiction and non-expert communities. Weak signals give a glimpse into the future but are hard to find. They are signals that mostly only appear in a geographically limited region and, therefore, are only noticed by a small number of people but may become a driving force in the future.[3]

Figure 1 shows the life cycle of a trend and highlights that all trends arise from emerging issues, whereas emerging issues can evolve from weak signals, which are to be found in the very left corner of the graph.[4] The case with megatrends is that these do not happen linearly; megatrends develop over a long period, have global effects and tend to stay for the long-term.

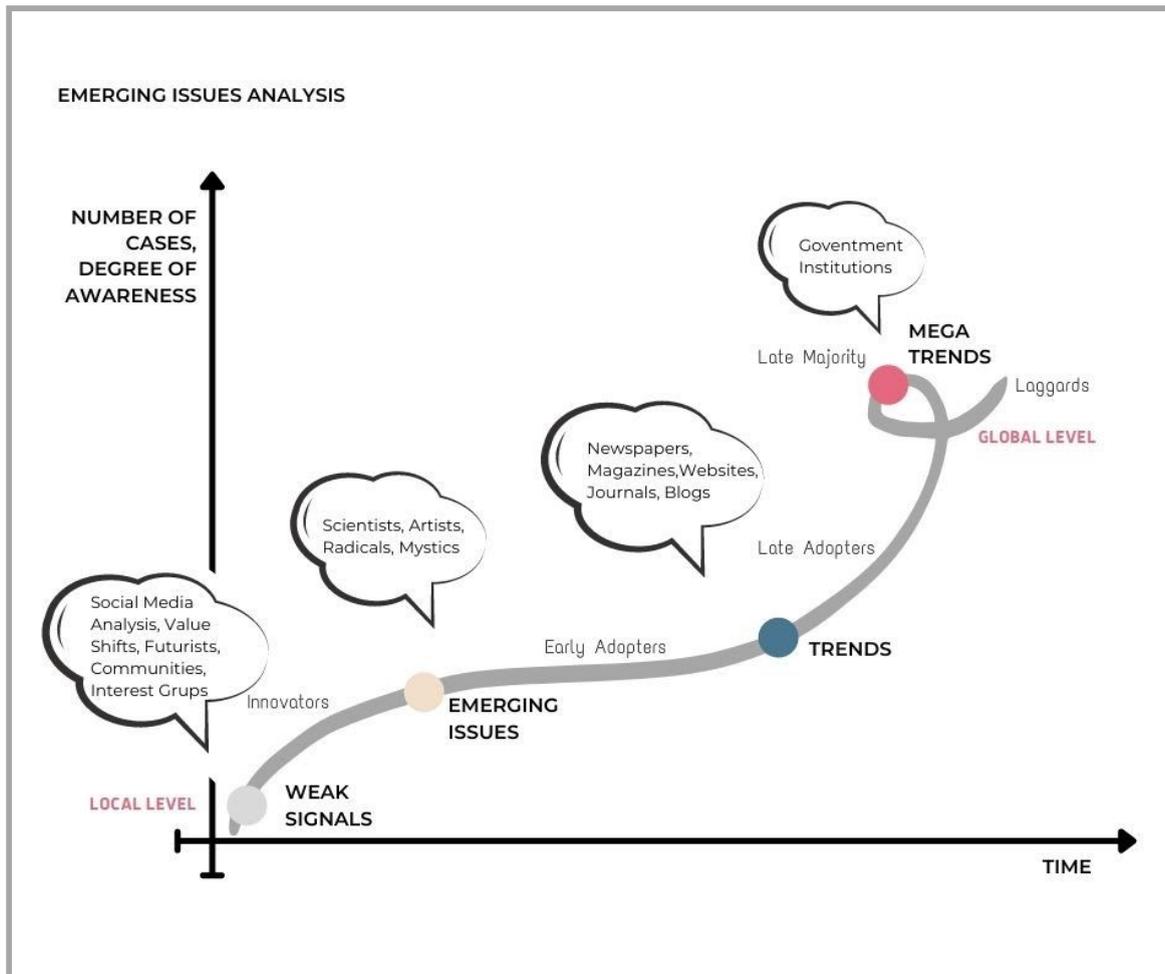


Figure 1: Emerging Issue Analysis in comparison to other phenomena (adapted from Graham Molitor, Everett Rogers and Wendy Schultz[5])

V. Futures Mindset for Horizon Scanning

To create the most impact with any foresight activities, practitioners must understand critical concepts to challenge their current thinking and be able to identify novel, unexpected and expanding signals. Therefore, below we introduce the concept of Futures Literacy, some of its core ideas as a foundation for the proposed foresight activities, and summarise its benefits.

Introduction to Futures Literacy

Futures Literacy is a capability; the combination of both cognitive and practical skills such as Futures Thinking, which includes Systems Thinking, Critical Thinking and Anticipatory Thinking. And Futures Methods and Tools, like trends, scenarios and much more (see Figure 2). These two entities, used in parallel, provide both individuals and organisations with the necessary competences to navigate uncertain futures, and act better and proactively towards the preferred one, or be prepared against or avoid the negative one

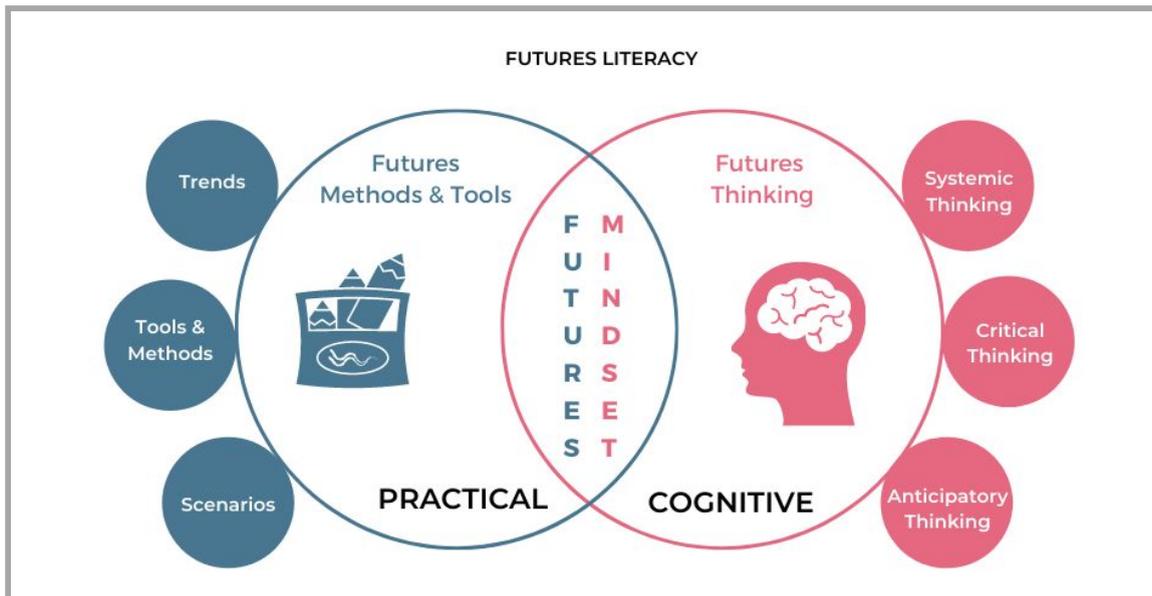


Figure 2: The concept of Futures Literacy as a foundation for building a Futures Mindset

Concept 1: One future vs alternative futures

There is a common mistake when thinking about the future; it is usually seen as linear and perceived in its singular form. Instead, the future can be better described as an open cone of possibilities and with it, opportunities as well as challenges and risks. This leads to the notion that not one future exists but rather multiple or alternative versions of the future that co-exist before time binds them together into the present. Joseph Voros revisits this idea of alternative futures by updating the so-called 'Future Cone' to its current version see Figure 3 below.[6] Next to the plausible, possible and preferable future, he also describes the potential, preposterous, probable and projected future.

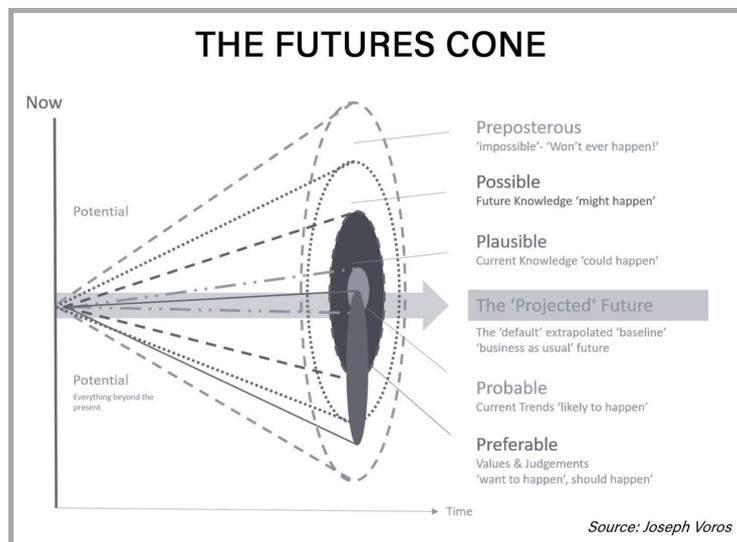


Figure 3: The Futures cone introducing the concept of alternative futures (adapted from Voros[6])

The concept explains that the future can be described in many shapes and forms and opens a space for exploring possibilities. The Futures Cone helps to define alternative futures and not only the future that seems most probable. Instead, it creates space to imagine diverse alternative futures and various pathways leading to one or the other. Over time, these pathways may merge into another one, fade away or lead to a

dead-end. When we map out each path, we realize that it is hard to reveal all of their possible branches from one's perspective. By combining our experiences and exploration with other actors' points of view, more and more details unfold. That is why a Futures Mindset always needs to be challenged by other diverse minds.

Concept 2: Predicting the future vs mapping the future

The biggest misconception about the "future" is that we seek the ability to predict it, to know precisely what will happen tomorrow or in a couple of years. However, the future is not written yet, which means that in most circumstances, we still have the power to change the course and current pathways to move towards a more desirable future; this, of course, by taking into account events that are outside of our control. Since the future is not fixed yet, we can learn how to use multiple futures constructively. This is why some describe Futures Thinking and the application of Futures Methods & Tools more as a journey and a mapping process that encourages exploration rather than prediction. Hence, the main benefit of Futures Thinking is that we can learn to manage uncertainty and complexity, so we can be proactive instead of reactive and become more resilient to unpredictable events.

Concept 3: Overcoming biases for diversified scanning

Cognitive biases affect our anticipatory thinking and hence need to be challenged to grow a Futures Mindset. A cognitive bias is a systematic deviation in thinking that appears whenever we process data and affects our decision and judgment capabilities.[7] Due to our brain's limitation of processing only a certain amount of data simultaneously, it tries to simplify this process by building rules of thumb or creating a subjective reality to make sense of the world.[7] Biases help our brains to make decisions faster, but they can limit us from seeing signals that do not match our predefined categories. They build our belief systems in how we see individuals, judge personalities and perceive culture.[7] A coherent list of cognitive biases has been identified by researchers over time and more recently visualised by John Manoogian III and Buster Benson.[8] In the following, we will highlight those biases that are relevant for a Horizon Scanning process.

Biases affecting foresight practitioners

While conducting any foresight activity, it is crucial to be aware of your biases and underlying assumptions when identifying weak signals and avoid limitations on how to explore the emerging future, analyse the present and interpret the past. The five most common cognitive biases are[8]:

1. **Confirmation bias** - the tendency to find and trust mostly information that confirms our existing beliefs. This leads to not finding signals that do not fit your current belief system.

2. **Hindsight bias** - the tendency to overestimate the predictability of an event after it has already occurred - also called the 'knew it all along effect'. This underrated the value of foresight as it seems not worthy.
3. **Anchoring bias** - the tendency to be overly influenced by the first data or piece of information that was found. As the first data is probably mainstream, it limits your capability to find weak signals that are less probable.
4. **Ambiguity effect bias** - the tendency to favour an option where the outcome is known rather over an option where the outcome is unknown. This bias limits your ability to imagine new things.
5. **Bandwagon effect bias** - the tendency to adopt or be more likely to believe data or pieces of information that conform with existing trends or pleases the mind of the greater mass. This bias limits your ability to explore alternatives that are beyond the general belief systems.

How to overcome your biases with Futures Literacy?

We need to become aware of the existence of our biases and continuously challenge our own assumptions. Futures Literacy helps us think in innovative ways instead of using linear models based on our biases. Here are a few tricks to consider to reduce biases within your research team:

- **Replace existing biases with curiosity** and openness to see the world with different eyes.
- **Try to see the future from the perspective of the next generation** and the world they will live in instead of the situation we are currently in.
- **Increase the diversity of the people involved**, favour different cultural backgrounds and multiple languages. This also brings variation in the set of biases within your group and avoids some of the obvious.[9]
- **Create a mindmap of related ideas and concepts** around the research topic to uncover existing gaps and underlying assumptions?[9]

Summarising the benefits of a Futures Mindset

1. Grasping impacts, pathways, and agency

The basic concepts of Futures Thinking are exploring the long-term impacts of our actions and shaping a desirable future by identifying pathways on how to get there. Both are required; paths are useless if we do not know where we're heading, and a future vision is wasted time if we have no plan on how to get there.

2. Creating motivation, contribution, and purpose

By applying Futures Methods, organisations can refocus on their purpose and empower every employee to understand their part towards a common goal. Therefore, organisations can reshape their structures and retrain employees for future tasks by understanding the long-term implications of their actions.

3. Dealing with complexity, uncertainty & unpredictability

We cannot eliminate complexity nor uncertainty in times where the pace is high. Applying *Futures Thinking* provides us with skills to explore, to unwind and to change our minds as new information comes along. Being adaptive and admitting being wrong is more important than trying to prove that we are still right when all signs show in the opposite direction.

VI. Step-by-step scanning guide

The best way to conduct a scanning process is to follow an intentional process of investigation with clear goals. This guide can be used as a personal 'cheat sheet' that leads the reader through a detailed procedure on 'where to scan', 'how to scan' and 'what to scan for', and provides multiple options along the way. The guide consists of four main steps (see Figure 4 below):

- **STEP 1: Signal Spotting** is the beginning of the process and focuses on how to frame the scan and where to find signals.
- **STEP 2: Signal Scanning** outlines frameworks to utilise for best scanning results.
- **STEP 3: Sensemaking** is about understanding the signals collected and deepening the insights.
- **STEP 4: Communicating the outputs** is the last step and focuses on how to share the results.

For each step are different tools available that can support your scanning process. They range from complex, license-based tools made explicitly for Strategic Foresight exercises, to freemium and open-source online tools that can be used to perform each task separately. This guide focuses on the latter selection of tools and offers suggestions for each step of the horizon scanning process – please see section VII: 'Tools to use' to find out more. Lastly, you can find a detailed comparative analysis of those tools in the annex.

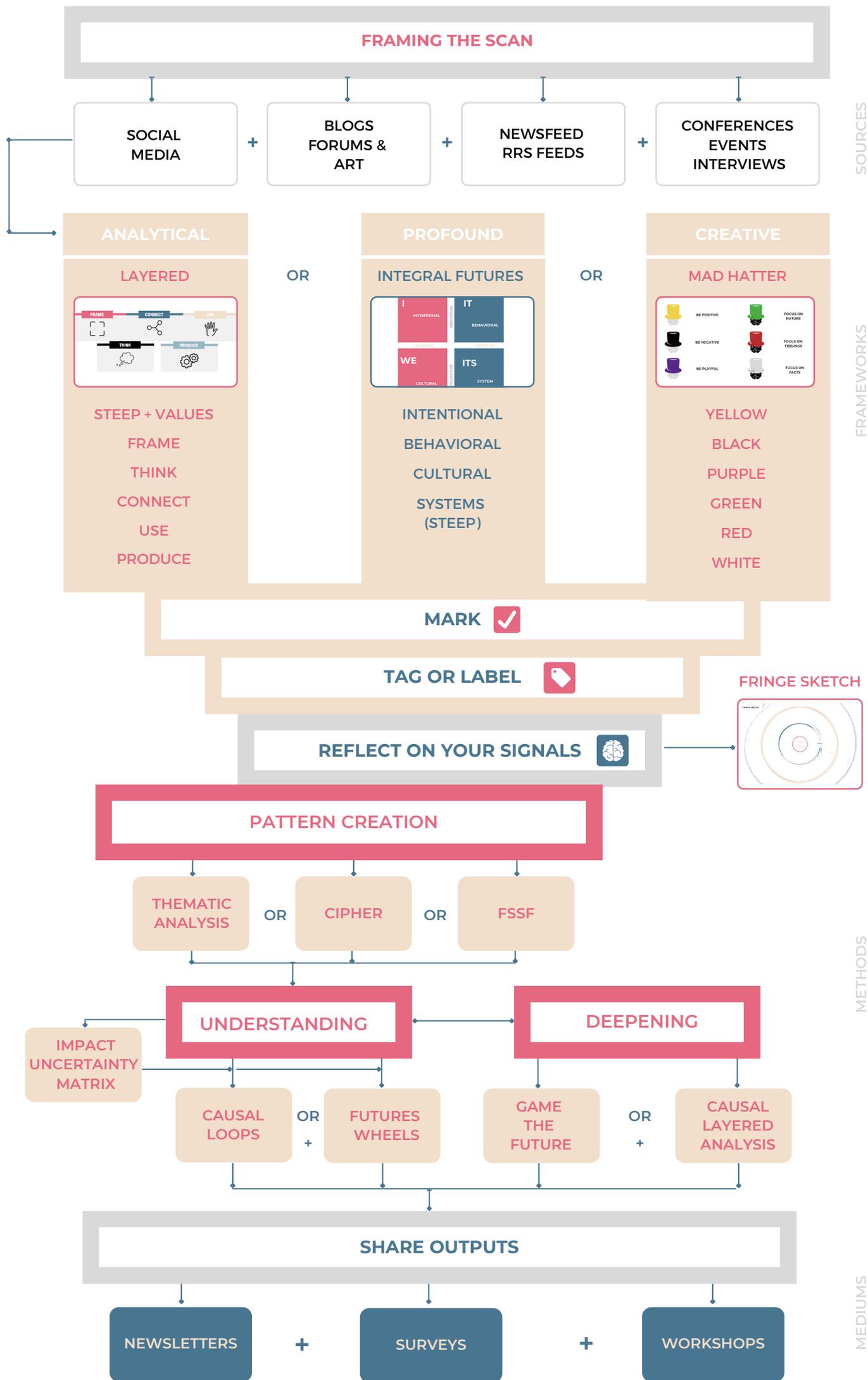
Figure 4: Visualisation of the step-by-step horizon scanning guide, including different options and pathways

1. SIGNAL SPOTTING

2. SIGNAL SCANNING

3. SENSEMAKING

4. COMMUNICATION



STEP 1: Signal spotting - locating the weak signals

The first step of the process focuses on framing your scanning by identifying the focal issue or research question and provides you with an overview of where to find research sources outside the usual references. These range from mainstream media, to news, blogs and conferences. It ends by giving useful tips and tricks on how to improve your scanning capabilities. Figure 5 provides an overview of the content of this step.

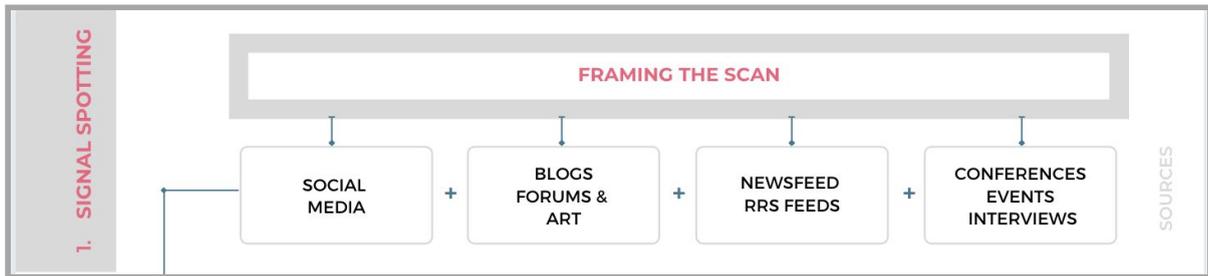


Figure 5: Visualisation of step 1 - Signal Spotting

1.1 Framing the scan

To spot relevant signals, you first need to establish a focal issue, an area of interest, or a research question. These could be somewhat broad as there needs to be room for exploration, but it can also be more specific if there is an area that requires focus at the time. Throughout the process, you can narrow and widen accordingly, keeping it flexible. To find your focal issue, use the following three questions as guidelines:

1. **What keeps you or your organisation awake at night?** - or, if you could ask an oracle, what would you ask?
2. **Which time horizon do you want to explore?** - do not start below ten years away from the future as you can always bring the future closer, but it's hard to reach further out once you begin too close to the present.
3. **What external matter do you want to know more about?** Make sure your research questions are broad and holistic enough.

Examples of focal issues:

- What is going on that could have an impact on the environment?
- What are the long-term impacts of Covid-19 on the Global South?
- How might the Circular Economy impact the world's economy by 2050?
- What changes are we seeing in the world after 50+ years of fossil fuels?

1.2 Where and how to scan?

Once you have selected your focal issue, you need to identify resources online and offline to start the exploration. Since the digital world is now an essential part of our lives, social media and digital magazines are great places to start. Further, include discussion forums and blogs as these are excellent sources of weak signals.

1.2.1 Where to scan? - Scanning domains & sources

A. Social Media

Online media plays a crucial role in our daily lives. It is shaping our perception of the world while reflecting social opinions and zeitgeist. The study of narratives and relevant opinion leaders on social media delivers crucial insights into cultural value, social opinions, and dynamic transitions. Monitoring relevant events and topics will help you detect new information. Topics live in the form of hashtags, so following a few key ones will help you in your research. In the infobox, we suggest the later and exciting accounts to follow on social media as these tend to show a broad spectrum of opinions and views on different topics.

Suggested Social Media Accounts to follow:

TechCrunch @TechCrunch
The Economist @TheEconomist
BBCNews @BBCNews
The Verge @verge
Futurism @futurism
Slate @Slate
Fast Company @FastCompany
Npr @NPR
Wired @WIRED
Mashable @mashable
WEF (World Economic Forum) @wef
GeekWire @geekwire
Vogue @voguemagazine
Cnet @CNET

Suggested Hashtags to follow:

#future
#scifiart
#scifi
#futureofwork
#GreenDeal
#ecofriendly
#sustainability
#zerowaste
#sustainableliving
#sustainablefashion

Check the trending hashtags

B. Blogs, forums, art & crowdsourcing platforms

Looking through blogs and forums will offer you an excellent opportunity to find weaker signals as these tend to arise more likely during recent conversations between people. Additionally, you can start a conversation with such groups by organizing open forums or including them in your research by sending out regular surveys. Another excellent spot to look for weak signals is in art, as artists navigate in contrasting environments. They later express, through their work, changes in society they observed through those interactions. Lastly, by checking out crowdsourcing platforms, you can follow and monitor disruptive innovations and emerging technologies.

Suggested forums, blogs, art channels & crowdsourcing platforms to follow:

Reddit is a network of communities based on people's interests. Find communities you're interested in, and become part of an online community! <https://www.reddit.com/>

Quora is a place to gain and share knowledge. It's a platform to ask questions and connect with people who contribute unique insights and quality answers. <https://www.quora.com/>

Medium is an open platform where readers find dynamic thinking, and where expert and undiscovered voices can share their writing on any topic. <https://medium.com/>

Kickstarter PBC is a funding platform for creative projects. Everything from films, games, and music to art, design, and technology

The Brant Foundation Art Study Center has two locations, in Greenwich, CT and New York, NY. <https://brantfoundation.org/>

BBC Culture - Covering the latest in global arts and culture in all its forms, BBC Culture gives an international view of film and TV, books, art, music and style. <https://www.bbc.com/culture>

The Museum of the Future is a place of tolerance, inviting varied cultural, global platform dedicated to the future of public service, held each year in Dubai. <https://museumofthefuture.ae/>

C. Newsfeed and RRS feeds

Be aware that looking for weak signals within this group of resources is the most challenging. Always be mindful of underlying biases depending on where the information is published and who the author is. The news only reflects the present and past state and needs to be collected with care to not fall into the confirmation bias. An excellent exercise for these resources is to search for the opposite signal, as stated in the news, by exploring less common and mainstream resources such as blogs and forums.

Suggested Webfeeds to follow (Use RSS Feed Reader):

Data-Smart City Solutions: datasmart.ash.harvard.edu/feeds
Climate Action News: ec.europa.eu/clima/rss/news/86/rss.xml
Top Environment News -- ScienceDaily - www.sciencedaily.com/rss/top/environment.xml
Oxford Analytica Europe - www.oxan.com/feed/feed?channel=c&group=Europe
Futurity - www.futurity.org/feed/
Reuters: Environment - feeds.reuters.com/reuters/environment
The Local Europe AB - www.thelocal.no/feeds/rss.php
NASA Breaking News - www.nasa.gov/rss/dyn/breaking_news.rss
Blog - Future Cities Lab - www.future-cities-lab.net/blog?format=RSS
foresight Culture - feeds.feedburner.com/foresightCulture
Global Economy - www.ft.com/global-economy?format=rss
Digital Trends - www.digitaltrends.com/feed/
foresight First - foresightfirst.io/feed/
Articles on TechRepublic - www.techrepublic.com/rssfeeds/articles/
Android Authority - www.androidauthority.com/feed/
McKinsey Technology - mckinseytech.curatasite.com/api/v1/articles.rss
TechCrunch - feeds.feedburner.com/TechCrunch/
BBC - World - feeds.bbc.co.uk/news/world/rss.xml
Strategic Culture Foundation - www.strategic-culture.org/rss.html
Inhabitat - Green Design, Innovation, Architecture, Green Building - <https://inhabitat.com/environment/feed/>

D. Conferences, events, interviews and conversations

Conferences and events are places of exchange, where people from different fields meet each other and challenge each other's thoughts through their work. As a consequence of such interaction, the conversations that arise inspire transformational thinking and change. Therefore these places are a great place to spot signals! Do not restrict yourself to future-related conferences or tech-only panels. Do go to scientific conferences organised by a diverse group of institutions that are presenting their latest research. Also, attend events of smaller, local initiatives and those conferences that are way outside your traditional radar.

Suggested interesting conferences to follow:

Futures Festival <https://futuresfestival.online/>
Global foresight Summit <https://www.globalforesightsummit.com/>
UNESCO Futures Literacy Summit
<https://events.unesco.org/event/?id=255234025&lang=1033>
PRIMER: <https://primerconference.com/>
ECSITE: <https://www.ecsite.eu/conference>
Z-day: <https://www.thezeitgeistmovement.com/zdayglobal/>
International Conference on Sustainable Development: <https://ic-sd.org/>
CES (Consumer Electronics Show) <https://www.ces.tech/>

1.2.2 How to scan? - Useful tips & tricks

Google search filters

Use the filters of Google search for more relevant and latest articles, e.g. the setting 'published within the last year'.

Triggered by emotional reactions

Dismiss the articles that are too similar, too obvious, too mainstream. According to Jim Dator's 2nd law of the Future: "*Any useful idea about the futures should appear to be ridiculous.*"[10] So, if it doesn't surprise you, it's not a relevant weak signal!

Draw from multiple languages

Especially an international scanning team can benefit from accessing sources in multiple languages. As shown earlier, all information is biased despite its point of origin. By scanning across different nations and languages, some of the biases mentioned earlier can be balanced.

Search for trend and counter-trend

Whenever you discover a weak signal, emerging issue or trend, ask yourself what would be the opposite direction of such a shift - look specifically for so-called counter-trends. If you find evidence for such opposite developments, note such by tagging or highlighting. Such movements may lead to an alternative future outcome if a counter-trend increases its impact over time.[11]

STEP 2: Signal scanning - collecting the weak signals

The second step provides three different variations of how to scan for weak signals. Each of the scanning frameworks has a slightly different focus and depth and is therefore listed as analytical, profound, and creative. You can select the approach that best suits your style of research and data processing. However, we encourage you to explore all of them; forcing yourself to adapt to different types of scanning will shift your focus and balance your bias and assumptions. You can also use the frameworks in combination. Further, we encourage you to "hack" them as you learn more about using them and making them fit your purpose! Lastly, at the end of this step, we provide you with a sketching and mind-mapping method and some reflecting questions that will help you revisit your scanning hits to sort the wheat from the chaff and decide which signals to keep and which are already mainstream. Figure 6 illustrates the three different scanning frameworks.

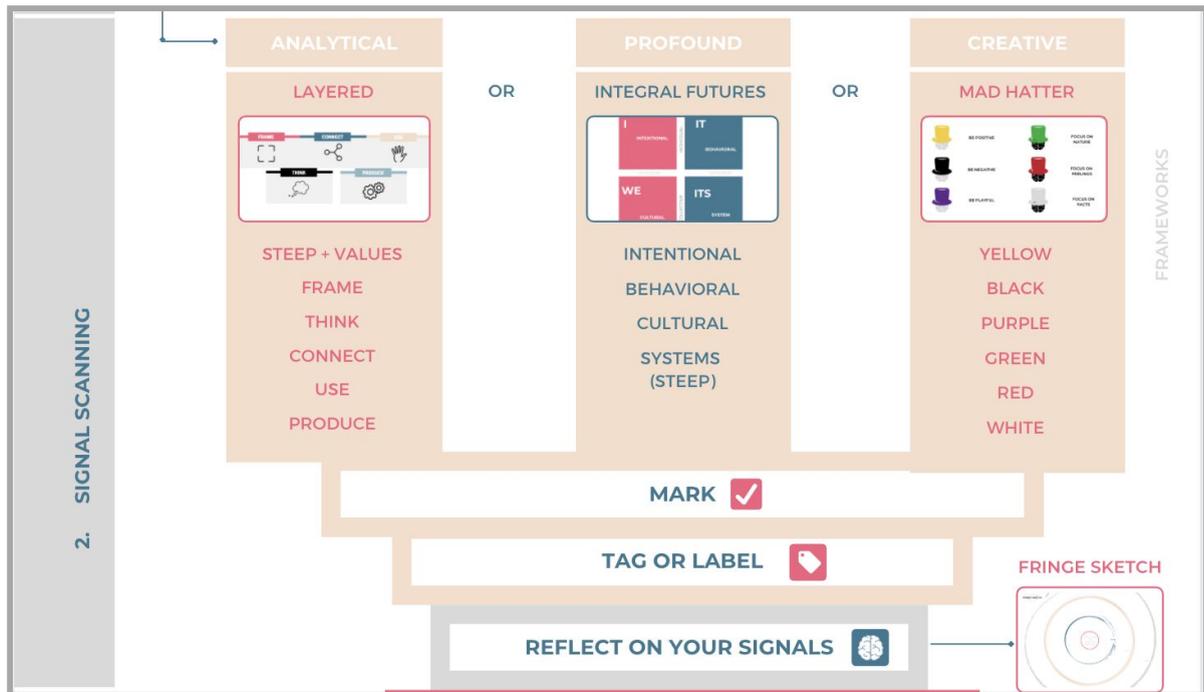


Figure 6: Visualisation of step 2 - Signal Scanning

2.1 The essence of scanning

In the foresight context, we understand scanning as the continuous monitoring of information about events internal and external to your organisation by systematically investigating, exploring and identifying weak signals. This process involves switching gears constantly and seamlessly, going broad (diverging in the thinking) and narrowing down (converging) throughout the process as new information is being collected. This allows you to build a more robust and targeted dataset and, thus, insights. It is important to remember that this process is iterative because the environment and the actors are constantly changing, hence creating new signals.

The very best of human scanning (as opposed to automated trends spotters) is that humans can read between the lines. Below are six key characteristics of a mindset required to do a robust scanning.

- **CRAVE CURIOSITY:** ask Why? more than What? and strive to explore deeper and deeper!
- **ACT COURAGEOUSLY:** embrace change, ask the uncomfortable questions, challenge the norms
- **WELCOME DIVERSITY:** do not limit your imagination by surrounding yourself with the same crowd, invite a diverse group of people to challenge your thinking!
- **THINK OUTRAGEOUSLY:** be edgy and weird, expand your research to resources that are uncommon, not yet mainstream

- **CONNECT THE DOTS:** think in systems, each and every element in your system is woven into something else
- **THINK IN PLURAL:** explore multiple possibilities of how the future may unfold and keep feeding your imagination

2.2 Using a framework for scanning

Scanning (both horizon and environmental) are key phases of any foresight process and are in themselves continuous exercises. Horizon Scanning is also best done frequently, as part of the organization's regular activities and ideally conducted by a diverse team. As mentioned, there are many ways to perform scanning; below, we describe three common scanning frameworks. Frameworks allow the scanner to look at the whole picture; following a framework ensures a robust collection and prevents the oversight of necessary, weak signals.

These three scanning frameworks are

- Layered Scanning (analytical)
 - Point of Manifestation
 - Point of Origin
 - Point of Impact (POI)
- Integral Futures (profound)
- Mad Hatter (creative)

A. Layered Scanning Framework [12] - analytical

'Layered Scanning' is part of the Natural Foresight concept, which presents a three-levelled approach to overcome our current thinking and biases. Besides utilizing the more traditional STEEP framework (which is the point of manifestation), it also scans for what it's called the point of origin (value shifts or V) and the point of impact.

Point of manifestation (STEEL)

This common scanning framework is used in environmental scanning to uncover present changes in the immediate surrounding. To move into the Horizon Scanning sphere, we introduce the next two layers.

Point of origin (Value Shifts or V)

By Scanning from the point of origin, we try to identify the underlying biases and assumptions hidden in the resources by searching for the value shifts in the future triggered through such events.

Point of impact (POI)

Scanning from the point of impacts helps us understand the long-term effects of the identified signals of cultural ideas, technology, tools & processes, products & services, and social change. This scanning approach provides more depth to each scanning hit and provides more context for impacts and implications. Figure 7 outlines the different categories and scanning questions

How to use the Layered Scanning framework

- Start exploring the research area by framing a few guiding questions (research questions) or thinking about a somewhat broad topic to investigate (focal issue).
- Once you have either questions or a focal issue, start scanning!
- Where? As mentioned before, you can look for signals in social media, blogs, articles, art, news, etc.
- Use all of these sources for the best scan hits!
- Don't be too specific in your search; remember you are **scanning the horizon**, so this has to be broad; most disruptions appear outside your immediate and usual field but will have a massive impact on it once they emerge.
- When you find an item that speaks to your focal issue, **unpack it by breaking it into smaller pieces using the following framework** you'll get plenty of insights.
- Use the **Layering Framework** described above to help you diversify your thinking, follow the rabbit hole to get carried away to strange places:
- Use **STEEP** as a first lens to guide your scanning; look for interesting articles where social, technological, environmental, economic or political phenomena pop up!
- Now look for **Value shifts!** Give those sources another go, but now think of the values embedded in those signals; what is changing?
- Use the questions and the template below to guide and reflect your scanning.

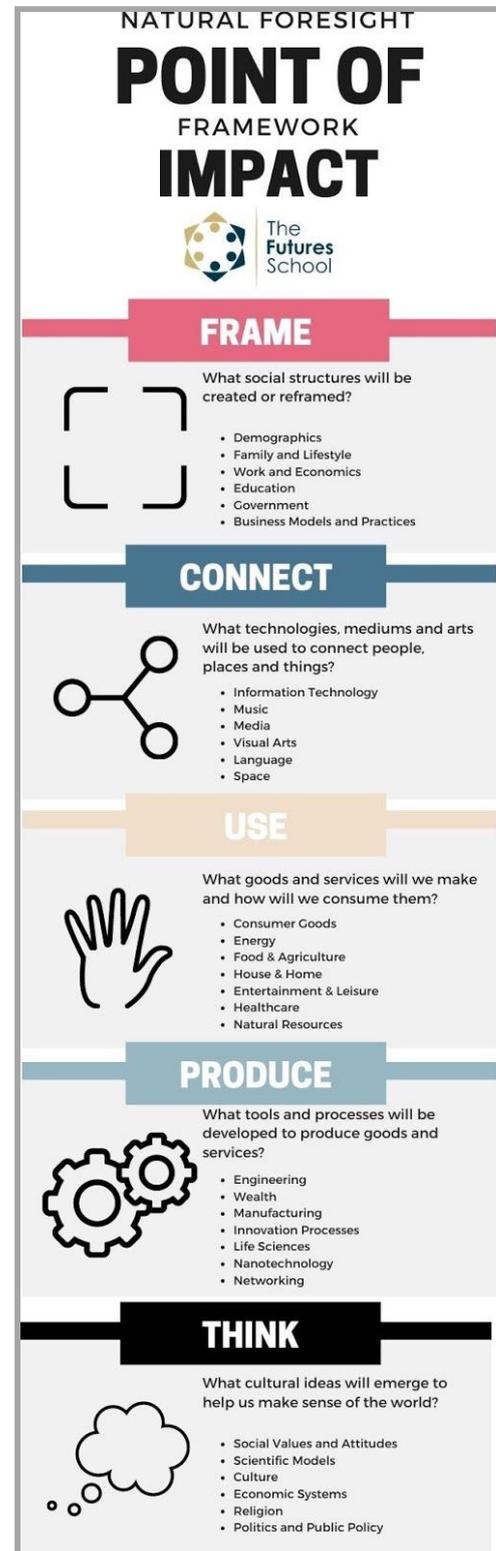


Figure 7: POI categories and guiding questions

- In parallel, use the **POI categories** to look for how people connect, what people are using and producing, how people are thinking and framing. This will help you to search in new areas and to think outside the box.
- Use the questions and the second template below to track your scanning.

Mark these data points as they will be clustered later on; **aim for three scan hits per week**, individually!
- Use **tags** or label your signals with the previous framework: if it was a signal related to social, tag it. If it's an object people are using, tag it with USE, and

General

- Take a look at the date the signal was created and where it was published - how does this help you to understand the broader context?
- Check the author, owner, or publisher - what biases might be embedded in this piece?
- Start saving the articles, posts, threads that seem interesting, relevant, radical, weird and ask yourself - Why?

STEEP+V Framework

- **SOCIETY** - Which social changes can you identify?
- **TECHNOLOGY** - Which new technologies are emerging?
- **ECONOMY** - Which factors are impacting the economy?
- **ENVIRONMENT** - Which factors are impacting the environment?
- **POLITICS** - Which policies or regulations are pushing or holding back the future?
- **VALUE SHIFTS** - Which value shifts can you observe?

Template (pdf and ppt version in annex)

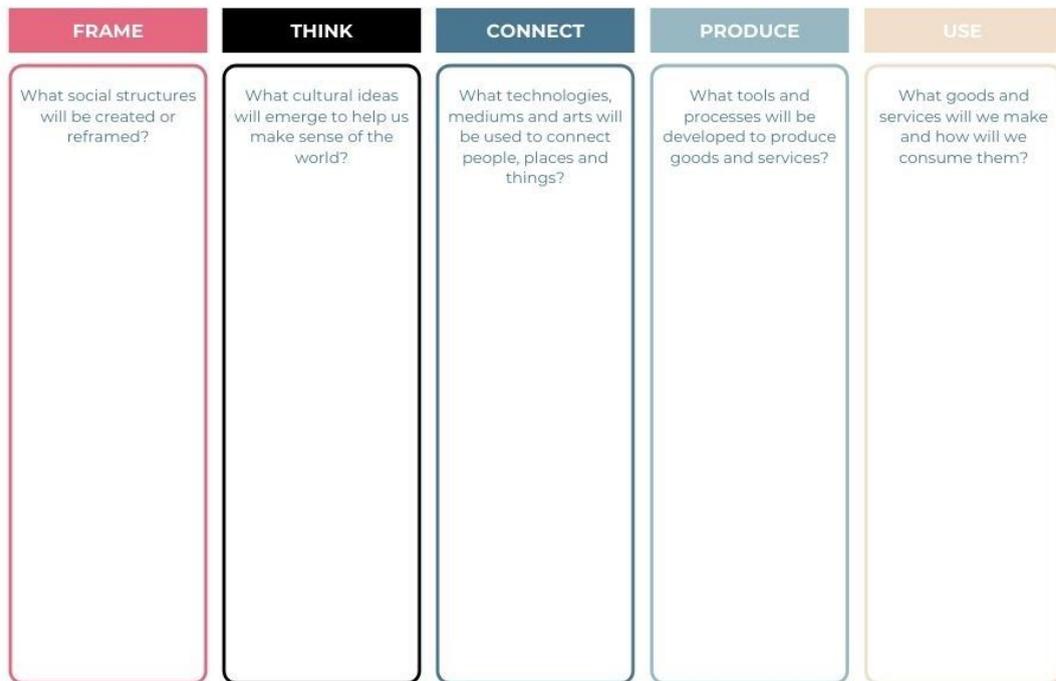


SOCIETY	TECHNOLOGY	ECONOMY	ENVIRONMENT	POLITICS	VALUES
Which social changes can you identify?	Which new technologies are emerging?	Which factors are impacting the economy?	Which factors are impacting the environment?	Which policies or regulations are pushing or holding back the future?	Which value shifts can you observe?

POI Categories- Framework

- **FRAME** - What social structures will be created or reframed?
- **THINK** - What cultural ideas will emerge to help us make sense of the world?
- **CONNECT** - What technologies, mediums and arts will be used to connect people, places and things?
- **PRODUCE** - What tools and processes will be developed to produce goods and services?
- **USE** - What goods and services will we make and how will we consume them?

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Kedge, 2019

B. Integral Futures [13] - profound

The Integral Futures concept supports diverse thinking by describing an approach beyond the system = external world we live in and its social, technological, environmental, economic and political drivers of change. Instead, it also analyses our behaviour and underlying mental models.

*"It ain't what you don't know that gets you into trouble.
It's what you know for sure that just ain't so."—Mark Twain*

When we are too confident about what we think or how the future will develop, we start to see only those signals that support our own beliefs while neglecting information that would prove us wrong (confirmation bias). This approach enables organisations and individuals to understand our interior, exterior, individual and collective world, preparing us for the uncertainty of the future.

Integral Futures, hence, offers a holistic approach where we first discover our individual value and belief system and then identify and become aware of the consequences caused by our actions. Then, we analyse where our mental models are rooted—our myths, traditions, and bedtimes stories. Finally, we get to the exercise most jump to straight away—the scanning of our external systems through frameworks such as STEEP

or PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) drivers and factors.

The Integral Futures approach works as a practical framework to search beyond the usual. It adds layers of understanding, such as value shifts, behavioural change, and how culture and traditions influence future developments.

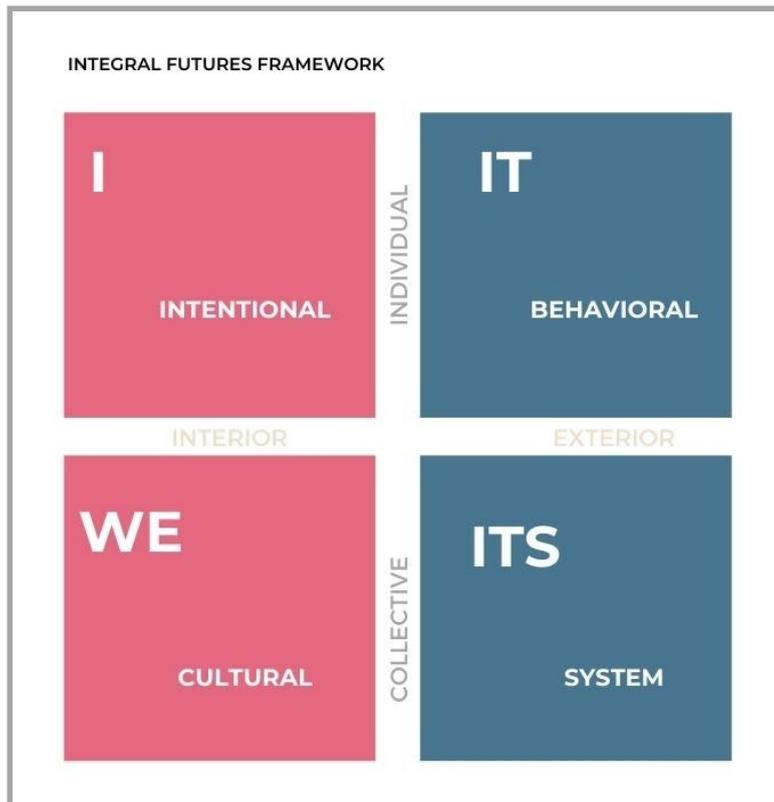


Figure 8: Integral Futures Quadrants (adapted from Wilber[14])

1. **Upper-left:** Intentional and represented by the 'I'. *This quadrant reflects our feelings, hopes, dreams, and intentions. It is what we think, believe and where our values are rooted.*
2. **Upper-right:** Behavioural and represented by the 'IT'. *This quadrant describes our individual behaviour, how we act and react due to our education, cultural background or intelligence.*
3. **Lower-left:** Cultural and represented by the 'WE'. *This quadrant describes our culture, myths and social world. The stories and traditions we know because we grew up in this world.*
4. **Lower-right:** Social (system) and represented by the 'ITS'. *This quadrant describes the system we live in and it is also where the well-known STEEP-Analysis is taking place.*

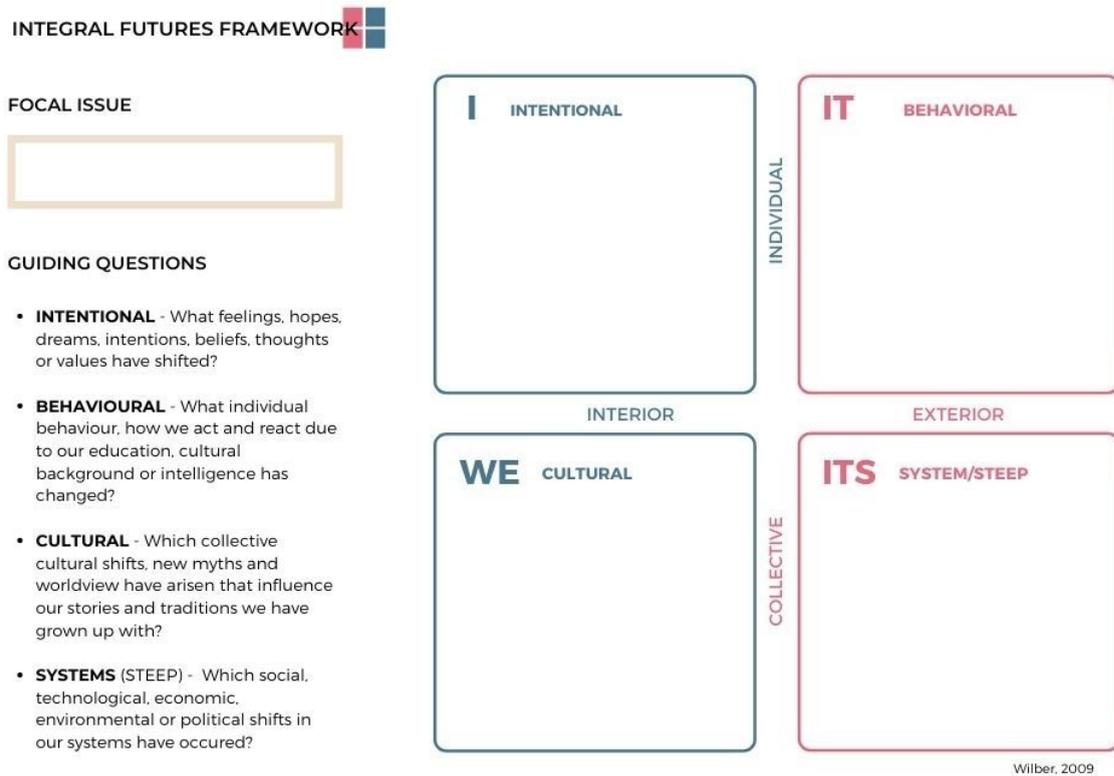
How to use the Integral Futures framework

- Start exploring the research field by framing a few guiding questions (research questions) or thinking about a somewhat broad topic to investigate (focal issue).
- Once you have either questions or a focal issue, start scanning!
- Where? As mentioned before, you can look for signals in social media, blogs, articles, art, news, etc.
- Use all of these sources for the best scan hits!
- Don't be too specific in your search; remember you are **scanning the horizon**, so this has to be broad; most disruptions appear outside the usual field and have a massive impact on it once they emerge.
- When you find an item that speaks to your focal issue, **unpack it by breaking it into smaller pieces using the following framework** you'll get plenty of insights.
- Use the **Integral Futures Framework**:
- Map out the **INTENTIONAL** piece by answering: *What feelings, hopes, dreams, intentions, beliefs, thoughts or values have shifted?*
- Now move to the **BEHAVIOURAL**: *What individual behaviour, how we act and react due to our education, cultural background or intelligence has changed?*
- In terms of the **CULTURAL**: *Which collective cultural shifts, new myths and worldviews have arisen that influence our stories and traditions we have grown up with?*
- And finally, take a look at the **SYSTEM**: *Which social, technological, economic, environmental or political shifts have occurred in our systems?*
- Use the template below to map your scanning.
- Mark these data points as they will be clustered later on; aim for three scan hits per week, individually!
- Tag or label your signals with the Integral Futures framework, tag it with Intentional, Behavioural, Cultural, or the matching STEEP category.

General

- Take a look at the date the signal was created and where it was published - how does this help you to understand the broader context?
- Check the author, owner, or publisher - what biases might be embedded in this piece?
- Start saving the articles, posts, threads that seem interesting, relevant, radical, weird and ask yourself - Why?

Template (pdf and ppt version in annex)



C. The “Mad Hatter” [15] - creative

The Mad Hatter is an adaptation from De Bono’s model ‘Six Thinking Hats’, which creates six artificial contexts for thinking, corresponding to the primary thought modes of objective, subjective, critical, and creative thinking. It is utilised to think outside the box in a creative process. *The Mad Hatter* is applied here as a way of thinking while conducting scanning activities. As researcher, you will “wear” one of the hats described below and use this as a lens or filter to spot signals (i.e. with the yellow hat - optimistic - we will look at signals from an optimistic perspective or point of view, whereas with the black hat - negative/pessimistic - we will search for signals from a negative one).

In one team, each member should wear a different hat at different times, to widen the scope, and get themselves out of the comfort zone. We tend to look more towards that which is familiar, therefore perpetuating our very own confirmation bias. The Mad Hatter is used to prevent the latter and groupthink (the phenomenon of conformity in a group resulting in a dysfunctional decision-making outcome). The six hats are illustrated in Figure 9.

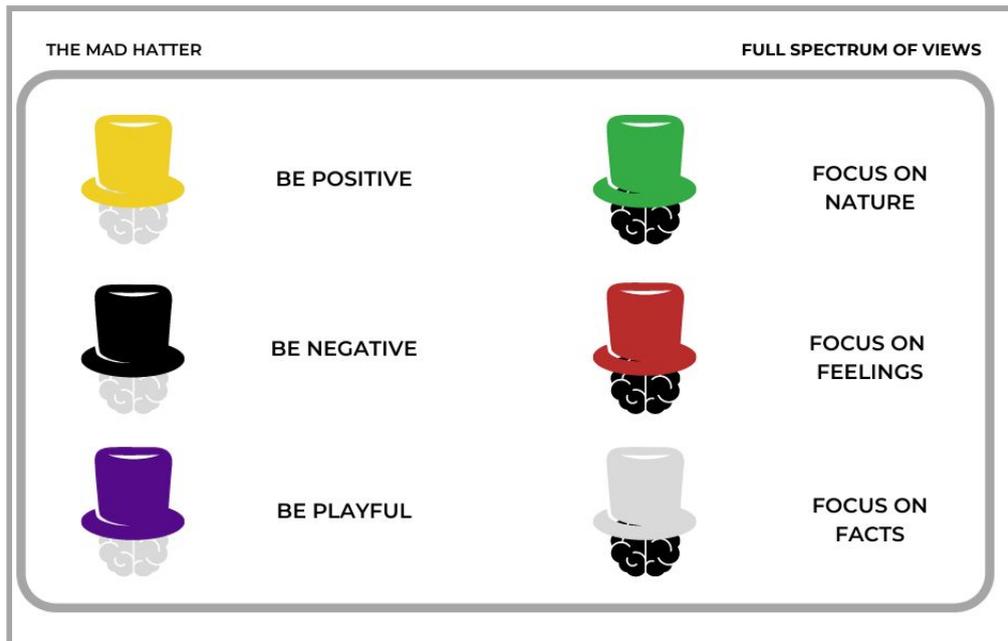


Figure 9: Mad Hatter Categories

How to use the Mad Hatter framework

This framework can be used in parallel to the other options or on its own.

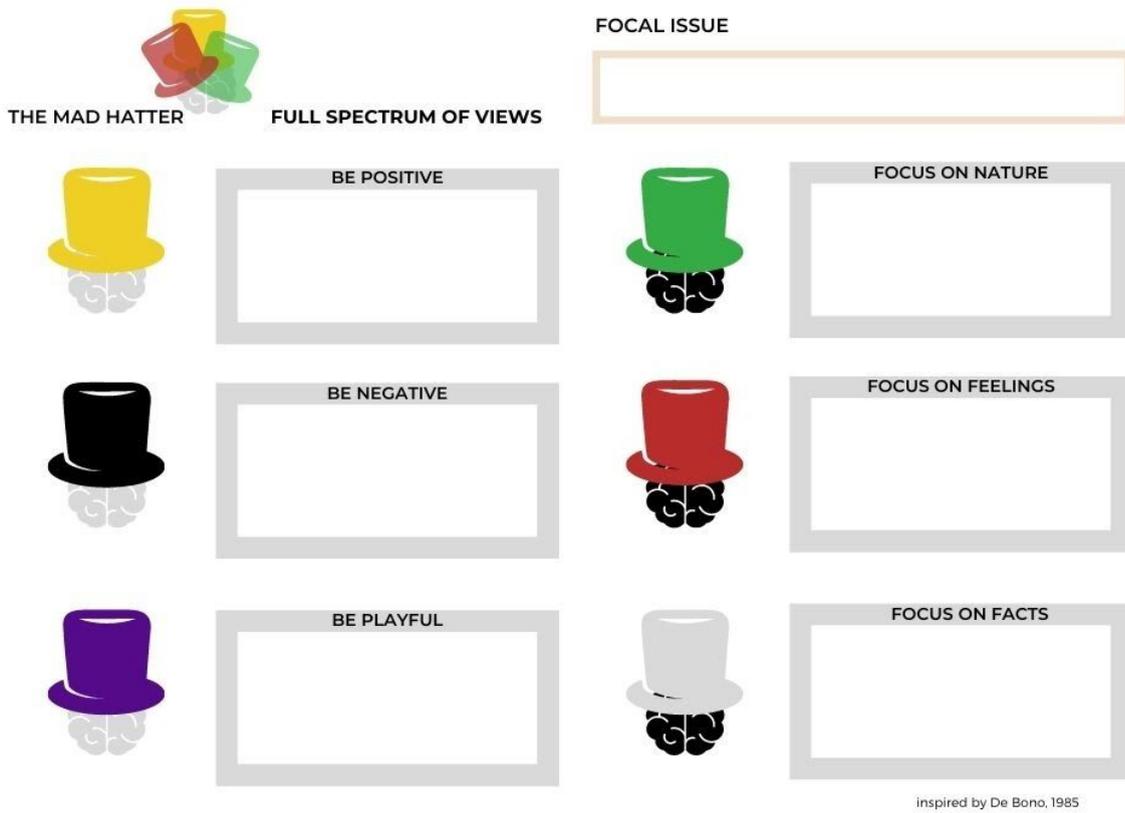
- Start exploring the area of research by framing a few guiding questions (research questions) or thinking about a somewhat broad topic to investigate (focal issue).
- Once you have either questions or a focal issue, start scanning!
- Where? As mentioned before, you can look for signals in social media, blogs, articles, art, news, etc.
- Use all of these sources for the best scan hits!
- Don't be too specific in your search; remember you are **scanning the horizon**, so this has to be broad; most disruptions appear outside your usual field but will have a massive impact on it once they emerge.
- When you find an item that speaks to your focal issue, **unpack it by breaking it into smaller pieces using the following framework** you'll get plenty of insights.
- Use the **Mad Hatter framework** to help you get the right balance of signals:
 - Wear the **White Hat** to look for facts, numbers, those signals that are somewhat **neutral**.
 - → Ask yourself: *Does this piece of information have a neutral perspective on the issue? Is this telling me facts and numbers?*

- While wearing the **Yellow Hat**, you should be looking for signals that have a bright connotation, a positive outcome that evokes **hopefulness**, and **optimistic views**.
 - → Try to answer: *What can I see that is positive, that speaks to a bright situation?*
 - When wearing the **Black Hat**, look into everything that can be **difficult, dangerous**, when things can go wrong, all the **negative**.
 - → Ask yourself: *What can go wrong here? What from this issue can be dangerous or create a difficulty?*
 - Wear the **Green Hat** to spot everything related to **nature**, the environment - a thriving, which may hint towards an **environmental balance**.
 - → Try to answer here: *How does nature look in this context? Can this hint towards environmental balance?*
 - While having the **Red Hat** on, you should be 100 **emotional**, follow your intuition and hunches.
 - → Answer here: *How does this piece make you feel? How would this make other people feel?*
 - While wearing the **Purple Hat**, you should go outside your comfort zone, be **playful**, joyful.
 - → *Be your inner child for a few minutes: What do you see through their eyes?*
- Let the clicking take you to strange places.
 - Try to wear different hats on each day of your scanning activities!
 - Members of the team can swap these hats continuously (every other day/every week) to keep the results diverse and rich.
 - Mark these data points as they will be clustered later on; aim for three scan hits per week, individually!
 - Tag or label your signals using the Mad Hatter framework: if it was a signal with a positive twist, tag it with YELLOW. If it created an emotion in you, tag it with RED, and so on.

General

- Take a look at the date the signal was created and where it was published: how does this help you to understand the broader context?
- Check the author, owner, or publisher: what biases might be embedded in this piece?
- Start saving the articles, posts, threads that seem interesting, relevant, radical, weird: ask yourself why?

Template (pdf and ppt version in annex)



2.3 Reflect on your scanning hits

After collecting a fair amount of signals, it's essential to reflect on how novel and relevant they are for your focal issue. Below is a fun and quick way to assess whether your signals are worth keeping or whether you need to leave some behind.

2.3.1 The Fringe Sketch [16]

The fringe sketch is a structured brainstorming that presents the scanning results of a horizon scanning process as a visualised map. Amy Webb described the process as follows[17]:

"First, flare at the fringe. Keep an open mind as you cast a wide enough net and gather information without judgment. This involves creating a map of what you observe at the fringe. This map should show nodes — or key concepts, companies, places, and people — and the relationships between them. Think of it as rounding up the "unusual suspects." You're brainstorming, making a fringe map, forcing yourself to think outside the box and consider radically different points of view."

The Fringe Sketch shown in Figure 10 acts as a visual map of scanned results and their relationships with each other concerning the research question or focal issue. Thereby, it will not reveal patterns or trends. It does not work as a full narrative but instead outlines the horizon by showing interconnections.

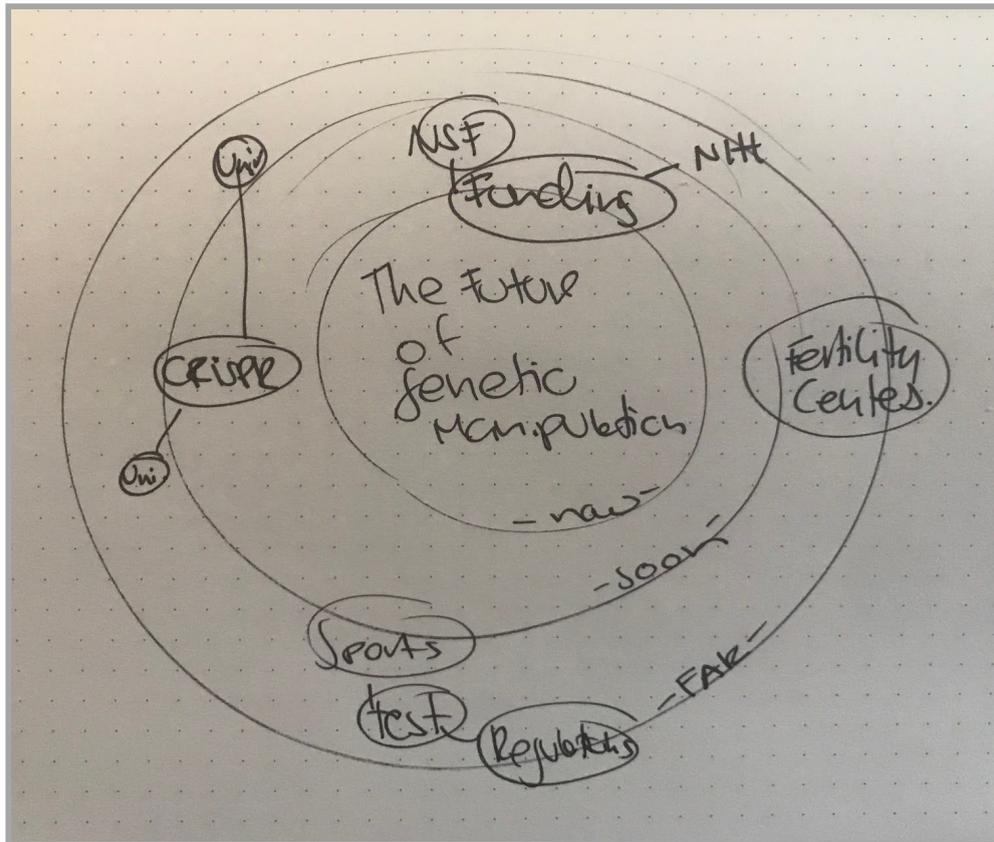


Figure 10: Example of a Fringe Map (adapted from Webb[16])

How to do the sketch

1. Use the **Fringe Sketch** approach described above to diversify your thinking and follow the rabbit hole to get carried away to strange places. Place your research question or focal issue in the centre of the map.
 - a. Draw three circles around the centre representing the **now**, **soon**, and **far**
 - b. Position your scanning results around the research question within the estimated time frame
 - c. Start building nodes and connectors amongst the items.
2. While creating the map, consider the following:
 - a. Include theoretical or even insufficient information.
 - b. Assume that a present-day obstacle might be overcome in the future.
 - c. Assume that if something can be hacked (or adapted for a slightly different use), it will.
3. After completing a fringe sketch, try to separate your **assumptions** from your actual **knowledge**. "The assumptions are the items you do not yet know to be true; but you also do not know them not to be true. Knowledge are things you know to be true"

- Where did some of your cherished beliefs influence your thinking?
- What are the assumptions you've made versus the knowledge you have?
- Code your fringe sketch to reflect your assumptions (mark in red) vs your knowledge (mark in blue).

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2.3.2 Fringe to mainstream [16]

In her book "The Signals Are Talking", Amy Webb makes an interesting observation, that any technology, new product or innovation that has made its way from 'Fringe to Mainstream' had to go through what she calls the 'seven stages of acceptance'. Before moving to any further evaluation of your scanned signals, you should go back to the questions below and ask yourself which reaction you have with each scanned signal.

Use this questionnaire from time to time to challenge your scanning routine.

The seven stages of acceptance

1. I've never heard of it. Why would I try it / advice in it / legalise it? Why should I care?
2. I've heard of it, but I think it's preposterous / dangerous / frivolous / unethical / will never work. It's a horrible idea.
3. I understand what it is, but I don't think it's useful / beneficial / helpful for me, my organisation, or the broader context.
4. I think it's potentially useful / beneficial / helpful. I'd like to start gathering data, to see what traction there is.
5. I've started to accept it as useful / beneficial / helpful, but I still think of it as a novelty. I'd like to see some research on how early adopters are using it.
6. I now use it all the time; it's part of my daily routine! I'm participating in similar projects. I'm looking for ways to collaborate.
7. It's indispensable. How did we ever manage without it? I'm looking forward to the initial implementation. I'm thinking about making a sustainable project. Damn—why didn't I think of that sooner? How did I miss it?

If you reacted almost all the time, as stated from question five onwards, your current scanning routine is leaning towards mainstream instead of fringe and thus your scanning might need to get more provocative. You may want to remove some of the mainstream scanning hits from your Fringe Sketch.

2.2.3 Scanning Checkpoint

After the previous reflection exercises, check whether your FringeSketch is incomplete or in which areas you see gaps:

- either decide to continue with your scanning, to fill the gaps, OR
- if you are satisfied with your scanning outlay, move on to the sensemaking steps

STEP 3: Sensemaking

The sensemaking phase is where the magic happens; there is a lot you can do with the continuously collected signals. The cadence for the below exercises can be weekly, quarterly, or every six months; each will have a different depth of analysis. Sensemaking is then a process of multiple activities as described in Figure 11. The first one is pattern creation, where the goal is to cluster the collected signals into patterns of change.

Bundling weak signals into a pattern leads to an emerging issue. A set of emerging issues can be clustered into a trend and finally a group of trends are categories either into a trend cluster (regional) or megatrend (global).

The second one identifies potential impacts by determining what might be, how these patterns can act and what they might influence. In other words, we analyse the consequences of the manifestation to better understand these changes; these can be both positive and negative and observable in many areas, such as those of STEEP+V / PESTLE. The third one is about gaining deeper insights, which involves going into the roots of the issues and imagining alternative futures.

The 3 Steps of sensemaking

- **Pattern creation** → Cluster signals
- **Understanding** → Identify potential impacts
- **Deepening** → Gain new insights

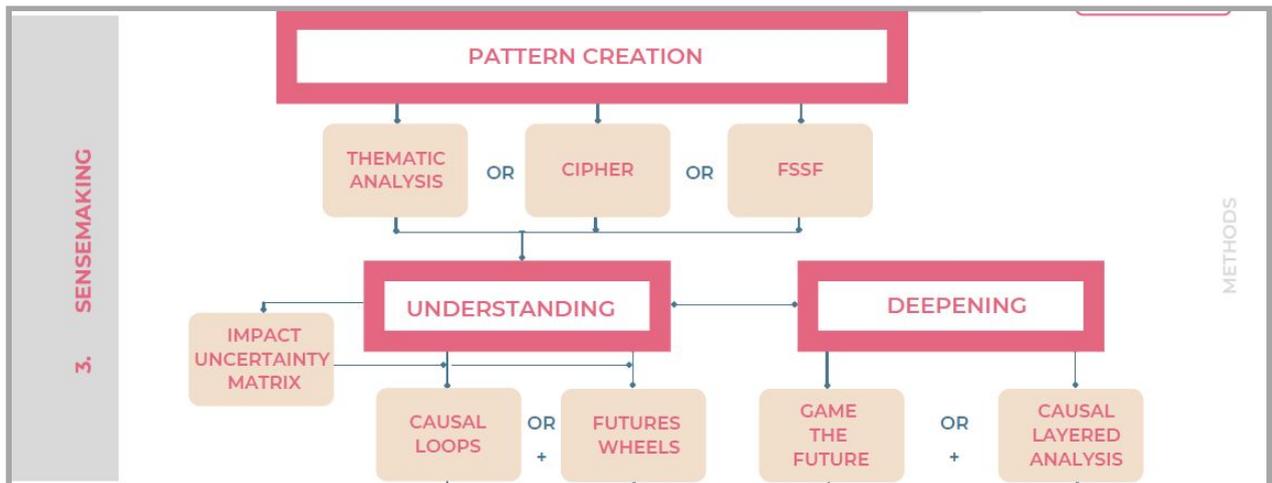


Figure 11: Visualisation of step 3 - Sensemaking

The methods presented below range from creative to analytical and can be used separately or iteratively to close the loop. As we have mentioned earlier, Horizon Scanning is not a linear process but indeed requires iterations and continuous follow-ups. Because of the scanners' development, their changing surroundings and the shift of other actors in the field, the possible futures, patterns, and signals will always change.

3.1. Pattern creation

Our brain continually categorises data and tries to match it with past experiences or knowledge. In his book 'Subliminal: How Your Unconscious Mind Rules Your Behavior', Leonard Mlodinow states that 95% of all of our thinking processes are unconscious.[18] By categorising all the information and data into clusters, we are able to speak new languages, learn new skills or come up with new ideas. It is our unconscious mind that automatically connects those dots creating patterns.[16]

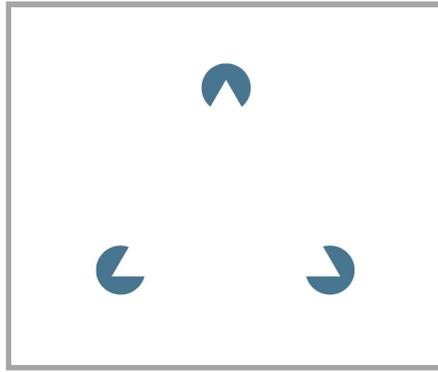


Figure 12: The Kanizsa triangle illusion (adapted from Webb[16])

In the Kanizsa triangle illusion (see figure 12) you will see a triangle that does not exist. Your brain sees a triangle although there are no lines drawing it. By zooming out and looking at your data from a new angle, you will discover new patterns over time.[16]

Below you will find different options for training your pattern recognition skills. Most of them work best in a workshop environment, where the other participants can challenge your biases and assumptions.

A. Thematic Analysis (TA) [19]

Thematic analysis (TA) is a method utilised to identify and organise signals by finding commonalities that in turn allow us to create patterns. By extracting “codes” from the source itself in the form of words, statements or sentences, and then grouping them based on whether they share some common characteristics described in the codes. These groupings are called patterns that become emerging issues. Continue by giving each of them a specific name. This process is illustrated in Figure 13.

This can be done in two ways or a combination of both:

1. as an **inductive approach**, driven by what is in the source; codes and patterns derive from the content of the signal itself.
2. as a **deductive approach**, the researcher brings their experience, concepts, ideas, or topics to interpret the signals

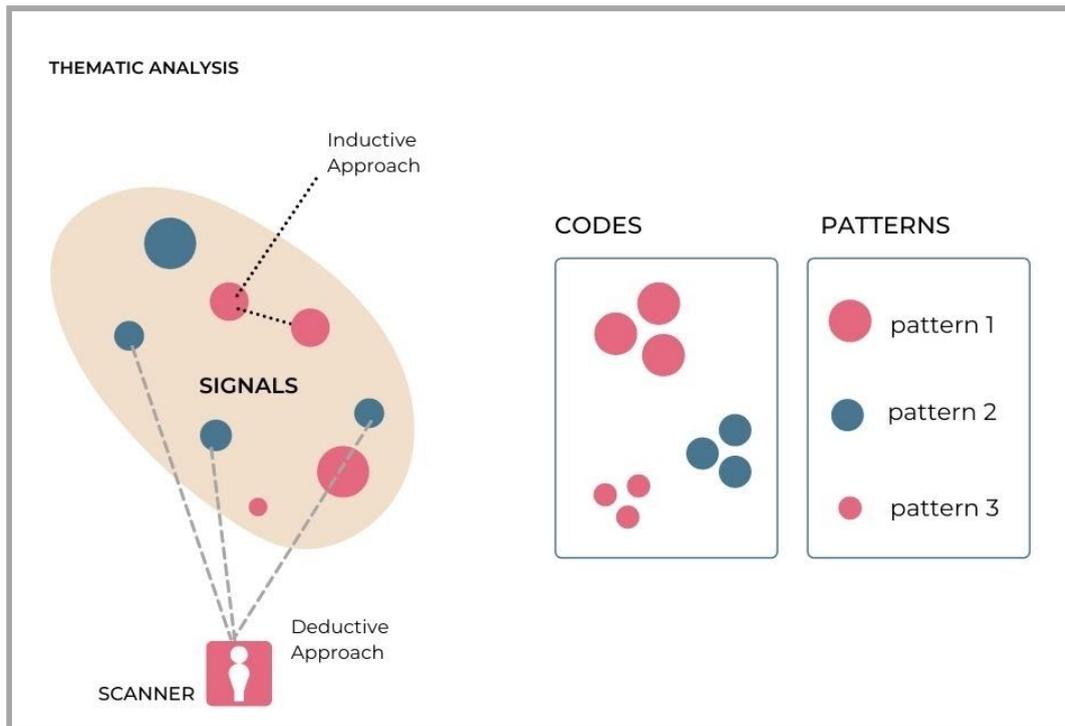


Figure 13: Structural example of the Thematic Analysis
(adapted from Braun & Clarke [19])

B. CIPHER Framework [16]

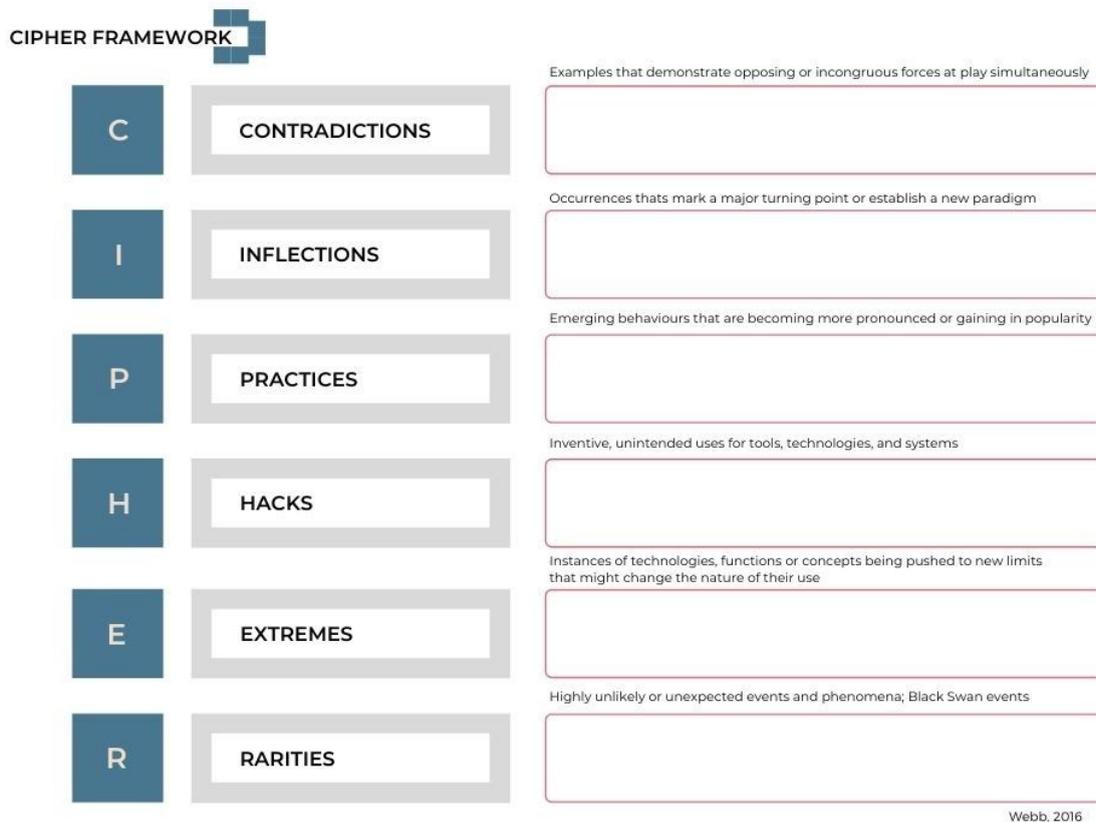
The CIPHER Framework was developed at the Future Today Institute to uncover hidden patterns by clustering signals from the scanning activities with the help of six pattern identifiers. After clustering signals along those identifiers, you will be able to see specific themes. These themes are your patterns that become emerging issues, give each them a specific name.

The identifiers are based on the acronym **CIPHER**: Contradictions, Inflections, Practices, Hacks, Extremes, Rarities and are described by the author as follows:

- **CONTRADICTIONS** - When two or more things succeed or fail simultaneously, though usually they would track in opposite directions; or when things track in the same direction, though typically the reverse would be true.
- **INFLECTIONS** - When something happens to catalyse a great acceleration in emerging research. This might include a sudden round of fundraising; the acquisition of a new company, product, or team; the passage or defeat of legislation; an unanticipated natural disaster, a market crash, or an act of terrorism.
- **PRACTICES** - When a new technology threatens the established orthodoxy. This orthodoxy might be a long-standing design exemplar (all phones have buttons), a mindset (people value their privacy), or a certain way of doing things (watching TV only on a television).

- **HACKS** - When consumers or companies are creating off-label uses for something such that it becomes more useful; or when someone finds an experience related to technology or digital media so frustrating that she builds something smarter, more intuitive, and easier to use.
- **EXTREMES** - When people are truly pushing boundaries in an attempt to break new ground. In many cases, they are pursuing research no one else has ever attempted. Or they are theorizing new ways to build, explore, see, manipulate, or replicate something that already exists.
- **RARITIES** - When something—for example, a social movement, an object, a community, a business practice, or a policy—is so unusual and unique that it seems like a meaningless outlier, but it actually solves a fundamental human need or transforms some element of society.

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C. Futures signals sense-making framework (FSSF) [20]

The FSSF is a framework developed by Tuomo Kuosa to categorise weak signals, wild cards, drivers, trends and other types of data. FSSF provides a clustering method to be carried out after a sufficient scanning activity, which is displayed in Figure 14. It is a tool to start-up the gathering, analysis, sensemaking and clustering process by placing it into six categories thus identifying whether the collected data is a weak signal, a trend or a driver of change. This process can be challenging and will become easier over time. However, once done, it helps to identify signals of change, hidden key factors, driving forces and barriers of change.

The framework consists of three levels of future knowledge:

“(A) weak signals, (B) drivers, and (C) trends. Each level is divided into two types: (1) a disrupting type of information which brings up the non-linear implications of, e.g., immergence (fading) or emergence of new structures, trends, phenomenon, processes, values or cultures, and (2) a promoting type of information which enhances our understanding of linear development in the future.”

Level A focuses on analysing single observations or groups of statements related to the research questions. Once you've scanned a new piece of information, you need to decide whether it is related to an existing trend or may even impact that trend. If so, you place it into level A Category 2. If the data you collected is surprising, disruptive and non-linear, you put it into Category 1.

At level B, you have a closer look at your research question and the data collected. If the data collected is a pushing driver of the research question, then you place it under Category 3. *“A pushing driver may be any seed of change, novel idea/meme, threat, opportunity, emerging technology, etc.”* Any data that describes a pulling driver relevant to the research question, such as increasing customer demand, place it under Category 4

Level C is for sensemaking and identifies trend-like factors from your scanned data. All trends should have a connection to your research question. Assign data that you can locate as a considerable disruption or a shift in values to Category 5. Lastly, place the collected data described as a linear “flowing river of change” under Category 6.

The FSSF process consists of three phases:

1. *Phase One: Review the scanned data and select the most exciting pieces.*
2. *Phase Two: Make sense out of them by clustering the information according to the six categories of FSSF*
3. *Phase Three: Identify patterns across the categories (main themes that occurred during the process) and give each of them a specific name.*

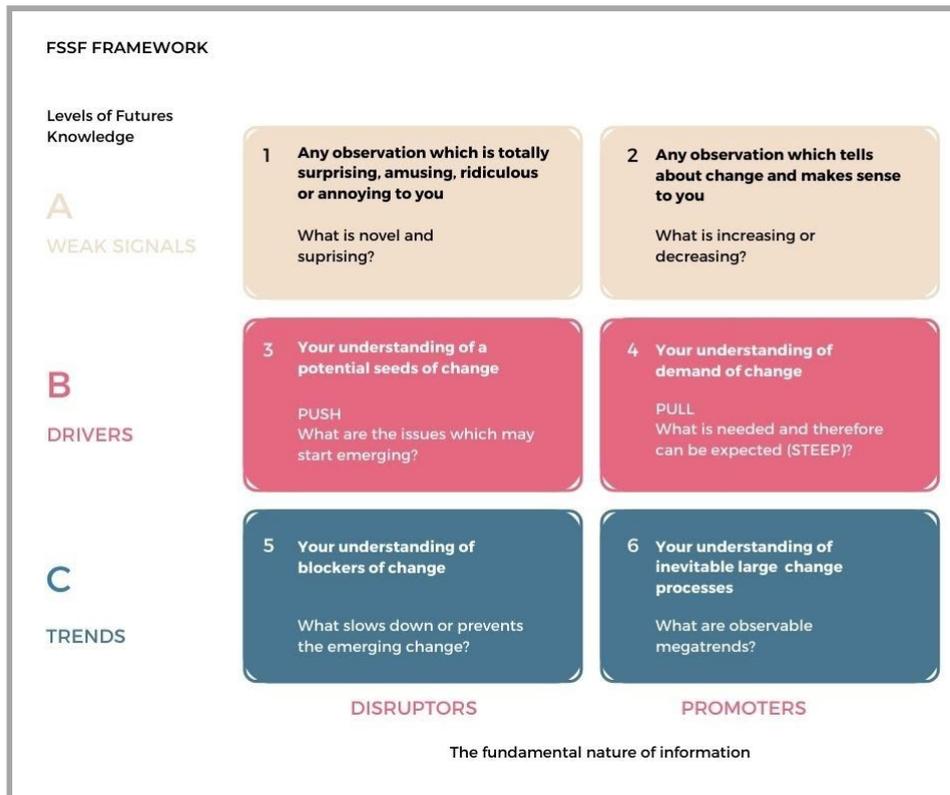
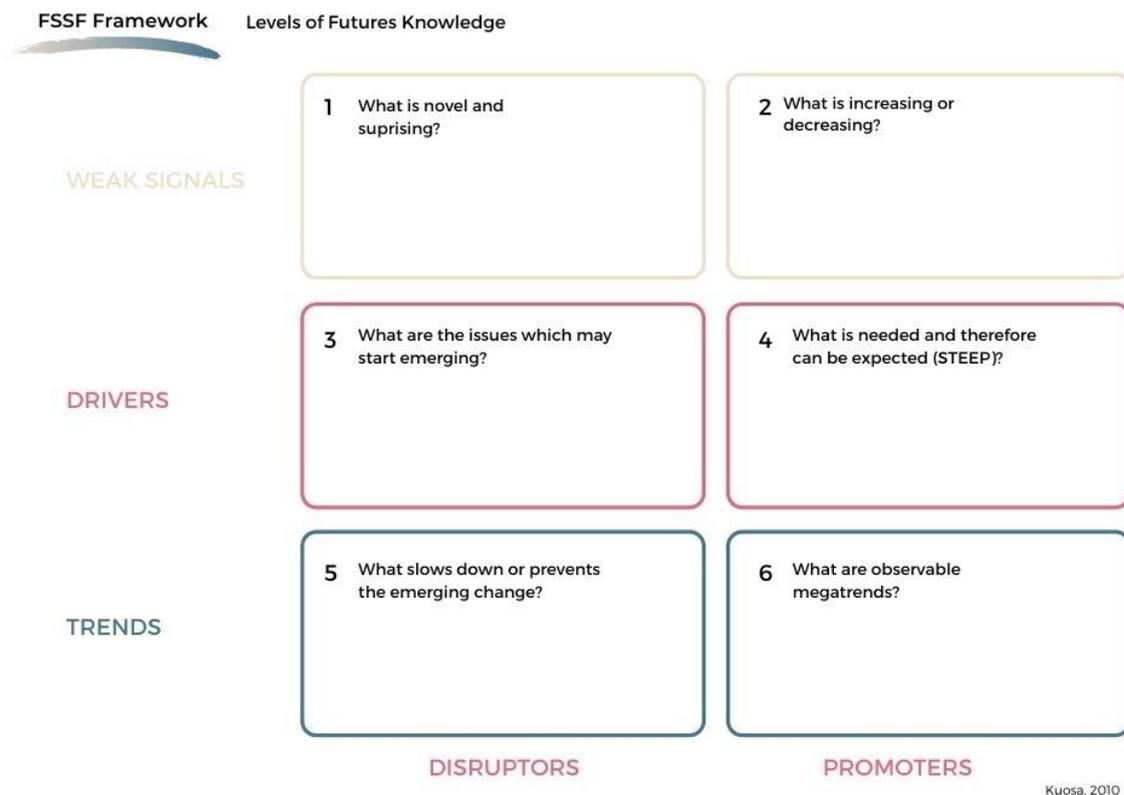


Figure 14: Futures signals sense-making framework (adapted from Kuosa[20])

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3.2. Understanding

If you have all your patterns created, this step helps to improve your scanning and pattern recognition capabilities. When searching for research questions that focus on ten or more years ahead, we do not find for each pattern enough relevant data in the present as such data from the future does not exist yet. Hence, we need to bridge the gap into the future by exploring and expanding the current findings into more distant time horizons. The exercises below help you expand your scanning to new horizons by exploring long-term impacts and their significance on the present.

A. Impact/Uncertainty Matrix [21]

The 'Impact/Uncertainty Matrix' shown in Figure 15 is a fundamental tool within the Strategic Foresight toolbox, used to identify critical uncertainties which need further exploration,, e.g. by creating a the Causal Loop Diagram or by using Futures Wheels. The tool aims to rate each identified emerging issue or trend in terms of its importance to the research question and its uncertainty on a scale from one (= low/weak) to ten (= high/strong).

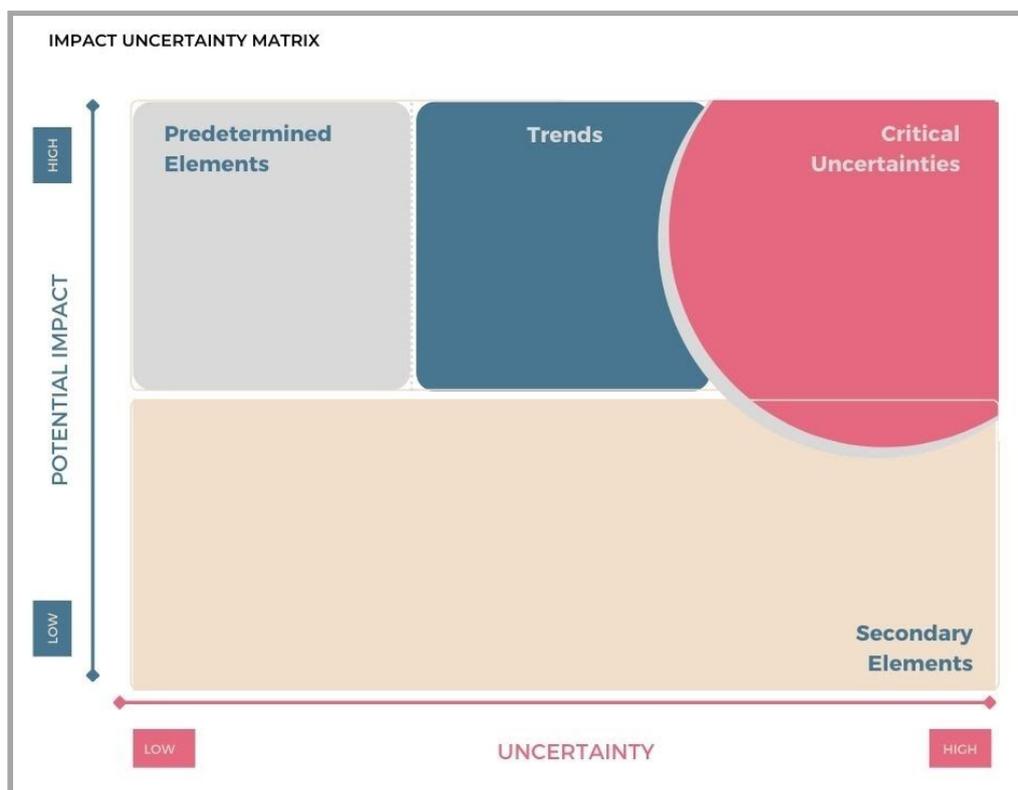


Figure 15: Impact/Uncertainty Matrix (adapted from Wulf, Brands & Meissner[21])

With this in mind, it is vital to differentiate between the terms uncertainty and probability. Whereas probability tries to anticipate the likelihood of whether an issue appears or not, uncertainty defines whether you have a clear vision of how the pattern evolves in the future, i.e. in its direction, strength, or variation. A high uncertainty, thereby, describes a sizable possible variance in how the pattern may occur. On the opposite, if you evaluate a pattern to be of low uncertainty (which equals a high

certainty), it means you have a clear and precise understanding of how the pattern will unfold in the future.

Example pattern: autonomous driving

- **Low uncertainty (high certainty):** You are very sure that autonomous driving will occur in 2050 only on highways and apart from complex cities.
- **High uncertainty (low certainty):** You believe that autonomous driving will play a significant role in 2050, but you have no idea or certainty if this will be only on highways, in cities or a combination of both.

Patterns that are rated with high uncertainty would benefit from being evaluated further, e.g. through a scenario exercise.

Pro Tip

Sometimes, it can help to ask a group to evaluate the certainty instead of the uncertainty of a pattern. For further analysis on the matrix, you would then invert the numbers of certainty to receive a pattern's uncertainty.

When to use

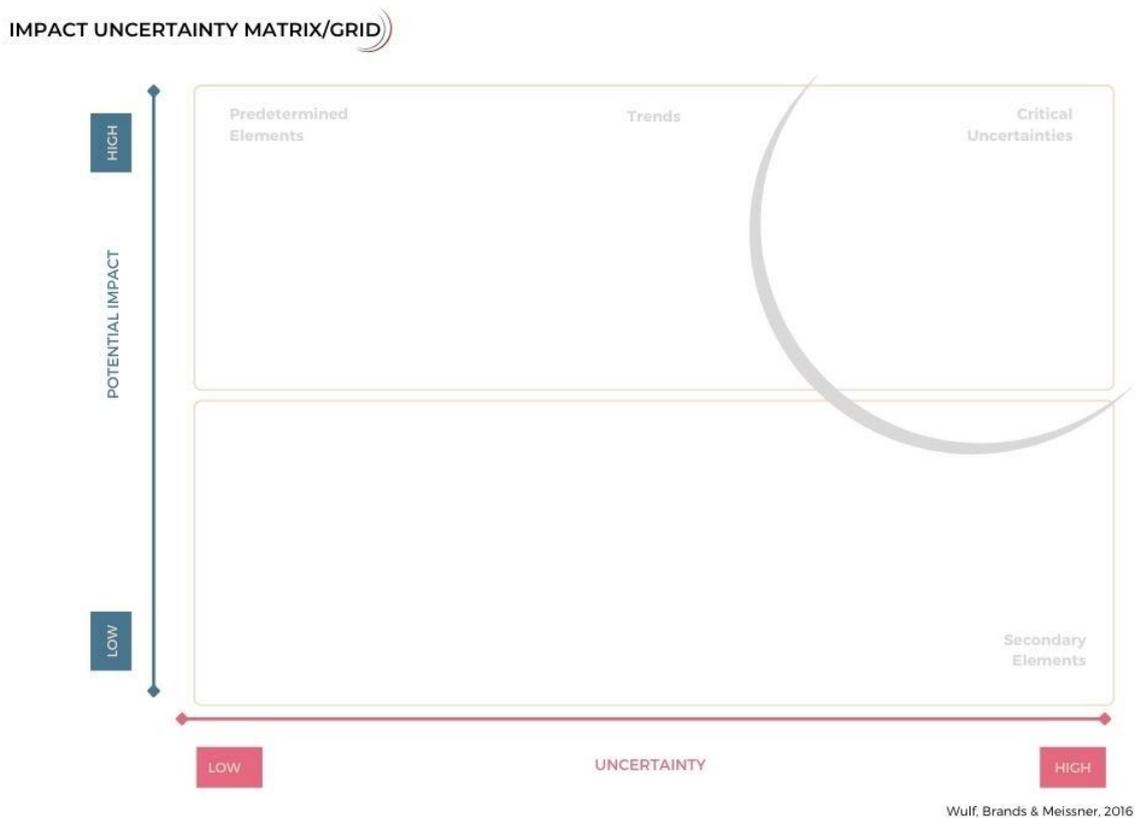
The tool is used to classify the identified patterns (e.g. emerging issues or trends) into critical uncertainties, predetermined certainties and trends. Critical uncertainties need to be further explored. Predetermined certainties need to be taken into account during strategic/policy planning, and trends are used to challenge the robustness of identified strategies or policies.

How to use - Step by Step

- Place the relevant patterns on the matrix according to your evaluation of its impact on the research question and its uncertainty for future developments.
- When doing this exercise in a group, let every participant rank the pattern by placing it on the matrix and then start a conversation on where you want to put it as a group.
- As a next step, cluster the relevant patterns into groups according to their location on the matrix.
- **SECONDARY ELEMENTS** (lower area of the matrix = low impact): These elements can mainly be ignored since they have only a minor impact on the research question.
- **PREDETERMINED ELEMENTS** (medium to high impact & low uncertainty): These elements are highly certain and should **always be considered** during strategic/policy planning processes.

- **TRENDS** (medium to high impact & medium uncertainty): The future direction of these trends are relatively certain, and they can have a high impact on the research question.
- **CRITICAL UNCERTAINTIES** (medium to high impact & high uncertainty): These elements have a high impact and are highly uncertain. These are the most important items on the grid as they are the most difficult to manage. How a pattern will develop, i.e. positively or negatively, is unknown and needs further evaluation. Hence, sometimes it is worth clustering them further into wild cards and black swans. All of those elements should be explored further, e.g. through a scenario exercise.
- As the last step, look for commonalities among the critical uncertainties to identify new meta-categories.

Template (pdf and ppt version in annex)



B. Causal Loops Diagrams [22]

Causal Loop Diagramming falls under the discipline of Systems Thinking, which focuses on unpacking and describing complex issues that ignite discussions around them. This diagramming method helps to map the relationships between the different focal or emerging issues and specific factors or patterns. Causal Loops have four key elements: the variables in the system are the **nouns**, the causal relationship between these are sometimes expressed as verbs, referring to the action itself. The arrow is the link between the variables (nouns) and the direction of the action or effect, and finally, the sign (+ or -)

represents the positive vs negative reinforcement, that is something increasing or decreasing in the system. Figure 16 shows a simple loop using all key elements.

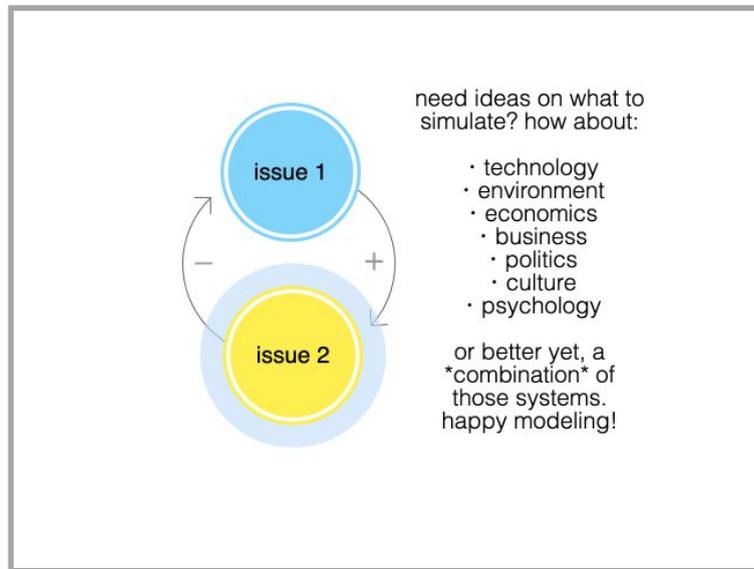


Figure 16: Simple loop using all key elements

By understanding the dynamic interactions between loops and linking together more than one loop, you can create a full story around the focal issue or research question. Figure 17 shows an advanced loop diagram. One of the benefits of this diagramming method is that it helps visualise the unintended consequences of issues and their impacts on the environment that may not seem related but have strong interconnections.

How to use Causal Loop Diagrams

- Identity and name the variables (as nouns) to analyse.
 - Remember, these are those emerging issues or patterns that can vary over time.
- Draw the links, the arrows connecting one issue to another, and another one.
 - Identify the direction of causality, the head of the arrow.
- Add a plus or minus sign depending on how much one variable/issue effects change on the other one.
 - If more of the variable X creates more of the variable Y, add a + sign. If the effect is the opposite, add a - sign.
- Continue with as many issues or patterns as you wish!
- Discuss and find connections between as many as there are.
- Use one of the tools suggested in section VIII “Tools” for virtual simulations or simply use the good old pencil and paper!

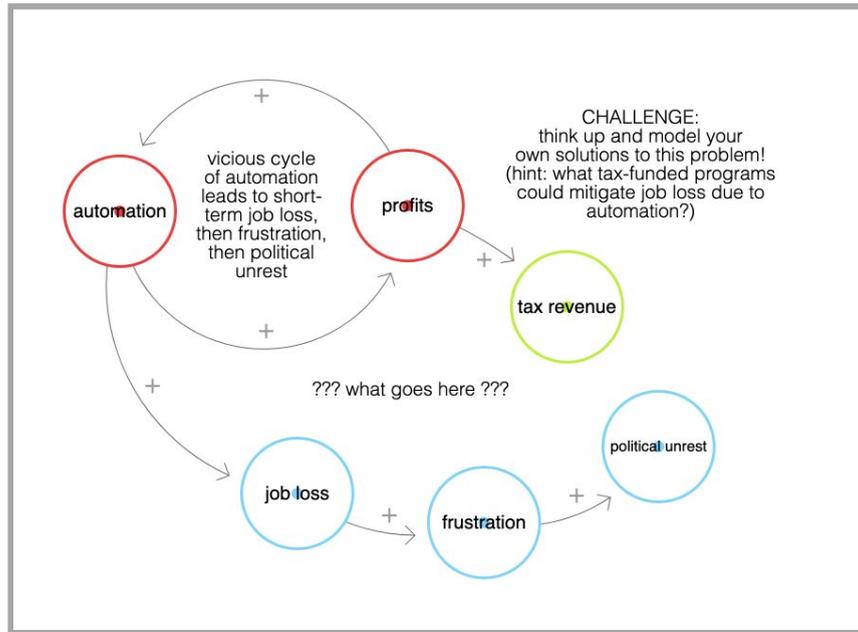


Figure 17: Advanced loop diagram

C. Impact analysis through Futures Wheels [23]

Once patterns are created, it is critical to identify and map the impacts or consequences of each pattern of change, in which areas these will unfold, and what they will look like throughout time. Futures Wheels is a method invented by Jerome C. Glenn in 1971. It is a form of structured brainstorming that helps to visualise how and to what extent certain changes impact the organisation, society or area in question. It is beneficial for identifying and mapping connections and casualties and it also helps us think far into the future. It can be great for the exploration of an issue or in the assessment phase. In a broader context, it's a great tool to work with before moving towards scenarios as it can help as inspiration for the development of multiple images of the future. This tool ensures the mapping of broad and robust first, second and multi-level implications. Below are two slightly different Futures Wheels presented: Drivers Wheel and Point of Impact Wheel:

Drivers Wheel [12]

An advanced version of the Futures Wheel is called Drivers Wheel. In addition to the structured brainstorming, you add the STEEP+V framework on top of the wheel for the first round to get a more diverse starting point.

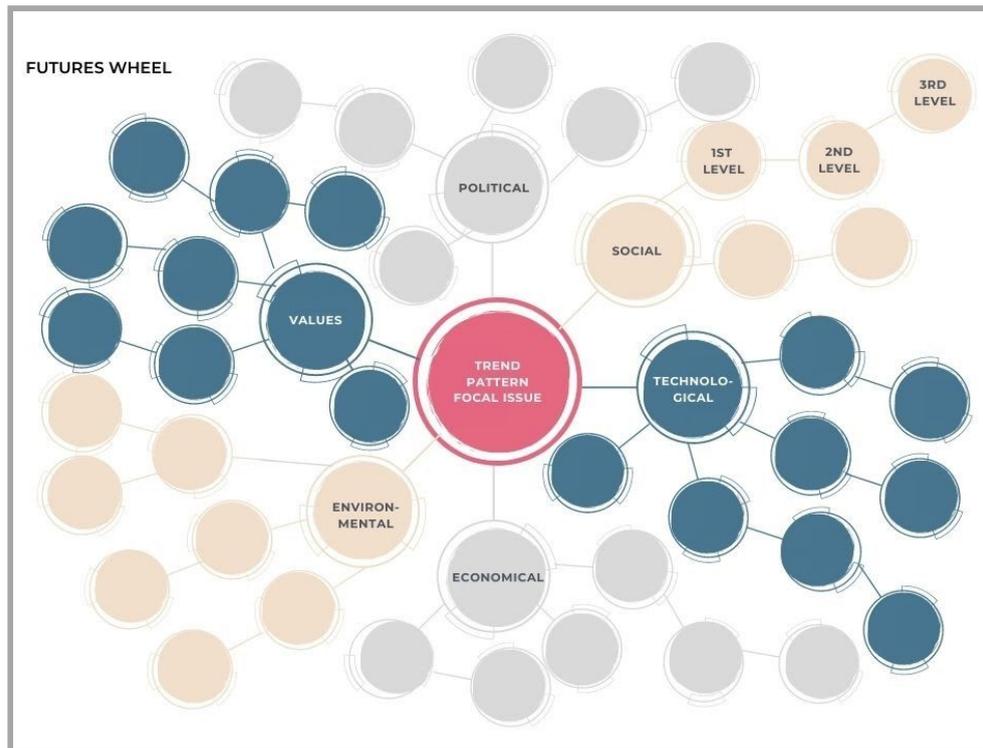


Figure 18: Drivers Wheel (adapted from Glenn [23])

How to use Drivers Wheel

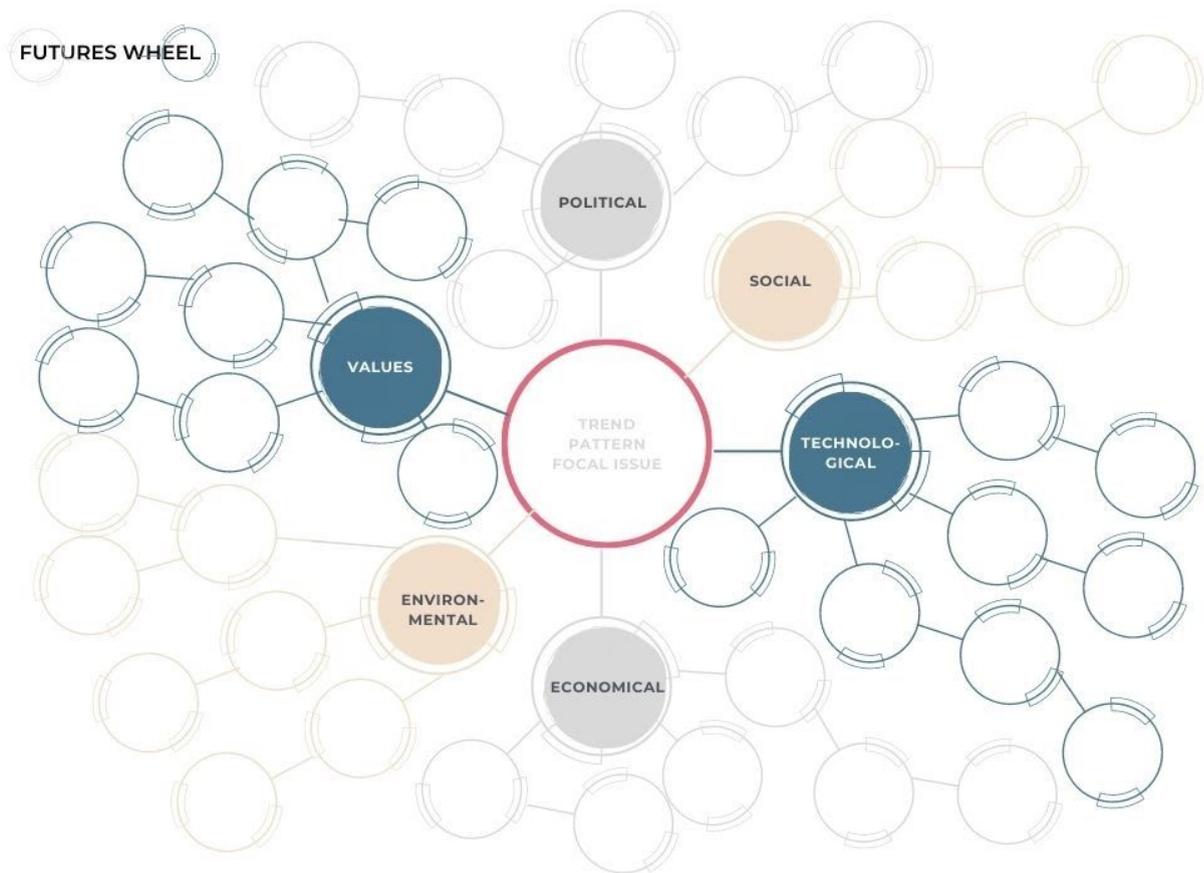
Select the emerging issue or topic to work with - try to break it down and make it precise as it is easier to find impacts.

1. Logically develop implications for the stakeholders involved - say, the organization, government body or target group or society as a whole - assuming the issue or topic has already occurred. Q: What are some benefits or threats to the new situation?
2. Use the STEEP+V Framework to diversify your thinking.
3. Once a new circle or impact is created, then brainstorm the second-order implications – the impact of the impact. In the second round, you can leave the STEEP+V framework behind.
4. Where there are disagreements, create a new impact line and new circle, use a different colour. Please note that differences make the process more robust; they enrich the future.
5. Continue to discuss the issue, the thinking and the implications for an extended period (even weeks) if possible. It is a great thing to come back repeatedly to a digital shared version, or to a printed version hanging on the wall of your working space.

Pro Tips

- Ask people to imagine the situation; what does this new pattern look like?
- Use the STEEP+V or PESTLE framework to make sure all impact areas are covered.
- Use elements of the Mad Hatter framework to make sure you get the right balance of impacts, positive, negative etc., and you do not stay within the same range!
- Try to work on the Futures Wheel not only during a workshop but for weeks, as many implications take time to emerge in your mind.

Template (pdf and ppt version in annex)



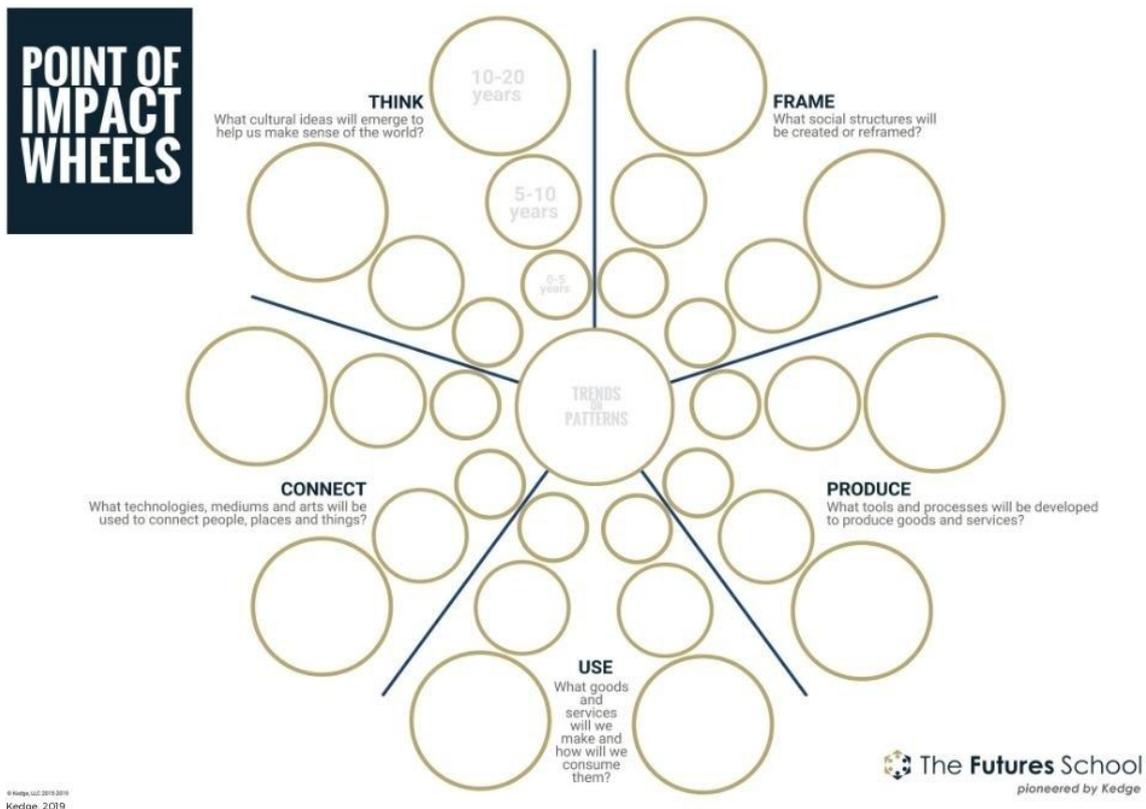
Point of Impact (POI) Wheel [12]

The Point of Impact Wheel (POI) is a foresight tool used to discover the near-, mid-, and long-term implications of the trends and patterns we have identified through the previous exercises. This wheel includes the additional dimension of the Point of Impact framework (see section 2.2) by establishing a foundation representative of a diverse set of macro influences, the tool ensures the mapping of broad and robust implications.

How to use Point of Impact Wheel

1. Select a trend or pattern.
2. Think about the implications of that trend or pattern from now and in five years. Diversify your thinking; use the Point of Impact categories to fill out each one of the sections. Try to answer each question, as shown below:
 - a. **FRAME** - What social structures will be created or reframed?
 - b. **THINK** - What cultural ideas will emerge to help us make sense of the world?
 - c. **CONNECT** - What technologies, mediums, and arts will be used to connect people, places and things?
 - d. **PRODUCE** - What tools and processes will be developed to produce goods and services?
 - e. **USE** - What goods and services will we make and how will we consume them?
3. Once a new circle or impact is created, brainstorm the second order implications – the result of the impact, and go further in time from five to ten years.
4. For the third order implications try to go even further in time from ten to twenty years in the future!

Template (pdf and ppt version in annex)



3.3 Deepening

The last activity of the sensemaking step trains your skills of identifying new signals by imagining alternative futures through gaming. Further, it helps you to deepen your understanding of the research question or focal issue by conducting a Causal Layered Analysis (CLA).

A. Imagining the future through gaming [24]

The Thing From the Future is a card game designed to push people to think outside-the-box about the future. It is meant to help participants imagine alternative futures by describing a 'thing' in a particular future assisted by a high number of prompts from the combination of four different cards. The main goal is to come up with a thought-provoking artefact and start a conversation about alternative futures. The scanning activities that you've performed before will help you to imagine different futures, and the futures you create will help broaden your scanning activity to explore new pathways.

When to use

- The Thing from the Future can be used in different contexts; given its playful nature, it helps people to open their minds to possibilities. Games are a great way to introduce complex concepts.
- It can be used before a Causal Layered Analysis (CLA) exercise to inspire, to help diverge the visions, ideas about multiple futures (see description below)
- It can be used after a CLA exercise to bring the transformed vision to life.
- The design process can be used as a brainstorming tool, for exploration and as an ideation exercise.

How to use The Thing From the Future

There are four types of cards in the deck: **Arc**, **Terrain**, **Object**, and **Mood**. At its core, The Future Things utilises Jim Dator's generic images of the future, the ARC cards.[25] ARC is like the lens with which you see the world your *thing* is situated in; these cards describe different types of possible futures, providing both the archetype and the time horizon. These four *worlds* are: Growth, Collapse, Discipline and Transform.

- **Growth** is a kind of future where everything and everyone keeps climbing: population, production, consumption...
- **Collapse** is a kind of future in which life as we know it is or has fallen apart.
- **Discipline** is a kind of future in which things are carefully managed by concerted coordination, perhaps top-down or perhaps collaboratively.
- **Transform** is a kind of future in which a profound historical transition has occurred, whether spiritual or technological in nature.

The other three cards are: TERRAIN is the context in which the thing is, the OBJECT describes the form of the thing, and MOOD is the prompt for the emotions the thing evokes.

This game is very flexible and can be played with a large number of people, split into groups of four or five, with as many rounds as wanted and with winners or not. You would either shuffle or pick one card of each type, and with that combination, describe, draw, or model the thing! Please share it with your group, big or small, and talk about the crazy ideas your colleagues came up with. Figure 19 shows an online version of the tool created by using the PDF card deck and the online tool Mural.

Download the card deck here: <http://situationlab.org/project/the-thing-from-the-future/>



Figure 19: Mural Design of The Thing from the Future

B. Transforming through Causal Layered Analysis [26]

Created in the late 1980s by Sohail Inayatullah, Causal Layered Analysis (CLA) is a futures method to imagine and create the future more effectively. It identifies and analyses different levels of understanding existing systems before creating new futures. It helps identify the root cause of a problem by peeling an issue layer by layer to understand the system. The four levels are the litany, the social/systemic causes, the worldview, and the myth/metaphor that roots deeply in existing culture, traditions or long-term history.

To understand the concept of a CLA even better, it helps to imagine it as an iceberg. Just like in real life, you can only see the tip of an iceberg above the water- this is the litany: often a phrase overused but visible to everyone. However, the real threat of an iceberg starts underneath the surface, as it triples in size and extension underwater. If we do not take a close look at what is happening beneath the surface, we miss the actual threat of the situation or issue.

When to use

In general, CLA does not anticipate the future but instead focuses on the exploration of transformative spaces and the imagination of alternative futures. CLA has been used to develop more robust policies and strategies as their approach helps shape diverse, long-term and inclusive futures. Other futures' methods often try to anticipate a future based on present trends; CLA instead reframes the future through alternative worldviews and narratives. Thus, it focuses on understanding both the past and the present to imagine transformative futures.

CLA approach can be used as:

- an exploration to identify and understand the deeper levels of present and future issues
- a stand-alone methodology to unfold diverse perspectives of an issue, as well as to set a future transformational vision.
- a part of a foresight process, e.g. to create scenarios.
- a method that works well in groups of five to ten or split groups for more extensive workshops

CLA consists of four levels:

- The Litany
- Social/Systemic Causes
- Worldview/Discourse
- Myth/Metaphor

How to use CLA

CLA unfolds several layers to discover deeper levels than the litany, which can also be seen as the headline of a current newspaper. It tries to uncover which processes, hierarchies, or systemic causes feed the litany on the systems level. Below the system, CLA searches for indicators that support the systemic layer by worldviews of diverse stakeholders. Each underlying level reveals a deeper understanding of the issue until it finds a metaphor, e.g. an image or comparison that mirrors the reality (see Figure 20).

CLA starts on the left at the present litany in a U-shape pathway and makes its way down to the present/past Metaphor before running in the other direction from a transformative Metaphor up to a new Litany.

Important: Do not jump across the layers!

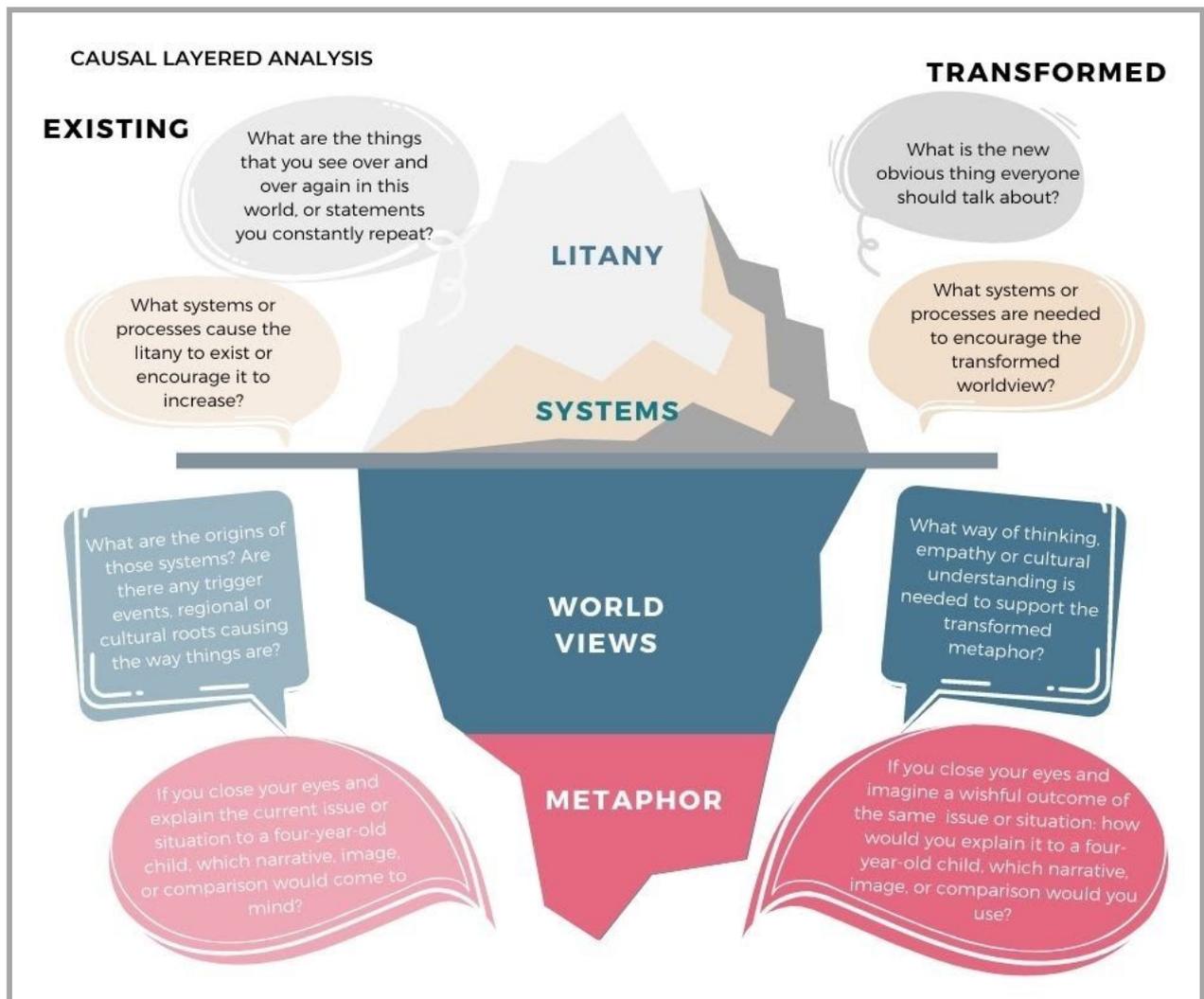


Figure 20: Iceberg model and structure of a CLA (adapted from Inayatullah[26])

Each level can be explored by answering the following questions:

- **EXISTING LITANY:** presents the obvious plain issue, as it would be stated in a newspaper's headline. - *What are the things that you see over and over again in this world or statements you constantly repeat?*
- **EXISTING SOCIAL/SYSTEMIC CAUSES** social, technological, economic, environmental and political systems, processes or hierarchies feeding the litany. - *What systems or processes cause the litany to exist or encourage it to increase?*
- **EXISTING WORLDVIEW/DISCOURSE:** deeper, unconsciously ideologies, biases, traditions and assumptions. - *What are the origins of those systems? Are there any trigger events, regional or cultural roots, causing the way things are?*
- **EXISTING MYTH/METAPHOR:** the unconscious dimensions of the issue, often stated in an image, a saying or narrative. - *If you close your eyes and*

explain the current issue or situation to a four-year-old child, which narrative, image, or comparison would come to mind?

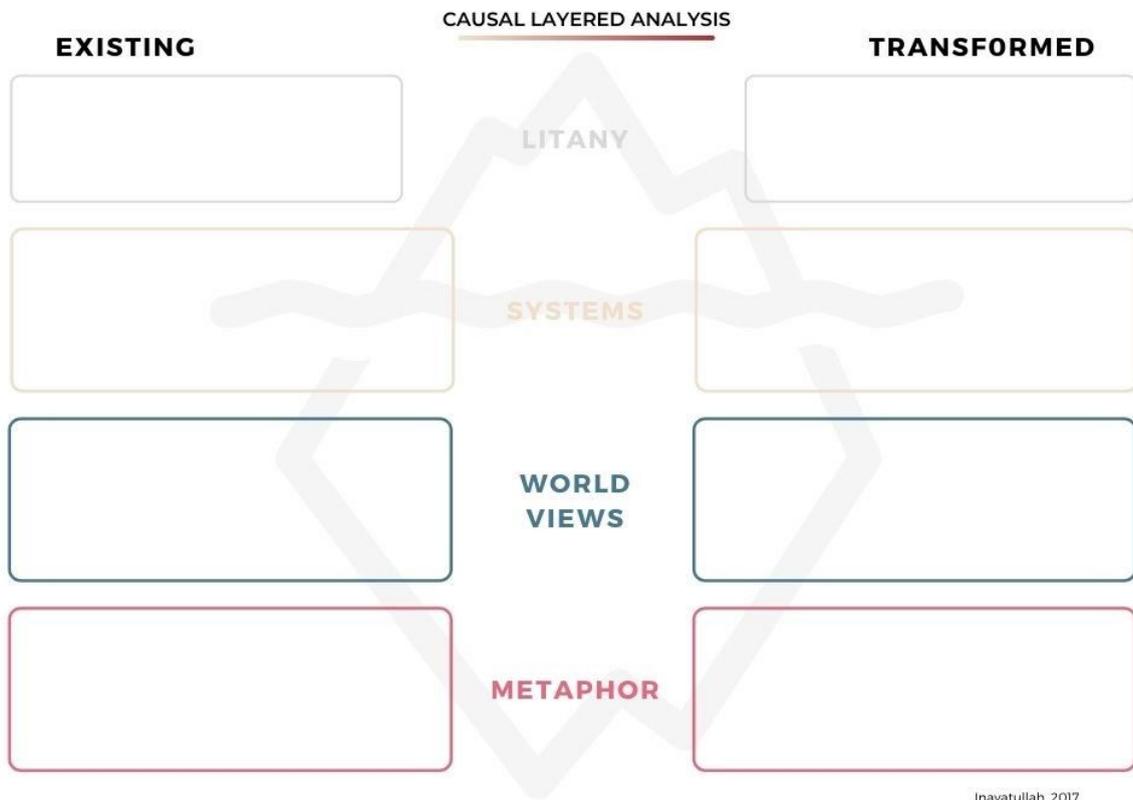
After the group has agreed on a current metaphor or image, move to the right side and find the transformed equivalents. Start from the metaphor this time and make your way up to the top!

- **TRANSFORMED MYTH/METAPHOR:** the wishful dimensions of the issue, often stated in the desired image, a saying or narrative. - *If you close your eyes and imagine a wishful outcome of the same issue or situation: how would you explain it to a four-year-old child? Which narrative, image, or comparison would you use?*
- **TRANSFORMED WORLDVIEW/DISCOURSE:** needed mindset to create or understand the new metaphor. - *What way of thinking, empathy or cultural understanding is required to support the transformed metaphor?*
- **TRANSFORMED SOCIAL/SYSTEMIC CAUSES** social, technological, economic, environmental and political systems, processes or hierarchies reinforcing the new mindset/worldview. - *What systems or processes are needed to encourage the transformed worldview?*
- **TRANSFORMED LITANY:** the desired vision that could be stated in a future newspaper's headline. - *What is the new obvious thing everyone should talk about?*

Peo Tips

- **LITANY:** *Agree on one issue to focus on.*
- **SYSTEMS:** *Brainstorm and collect as many systemic causes as possible or needed.*
- **WORLDVIEW:** *Ask yourself if you were born in a different part of the world, would you see things differently? Why? Which characteristics, biases and assumptions let you know the issue in this specific context?*
- **METAPHOR:** *Try a visioning exercise where the participants have to close their eyes and imagine the current situation or find a transformed metaphor.*

Template (pdf and ppt version in annex)



STEP 4: Communicating the outputs

As the last step of any scanning activity is to communicate the results in an engaging and informative way. Figure 21 shows a few different ways to share findings including some mediums you can use to get feedback and even more insights from your broader community. Finally, this chapter provides an example of how to communicate the results of a horizon scanning process by using a newsletter design. To share your outputs, we suggest using a variation of the following tools, mediums and formats.

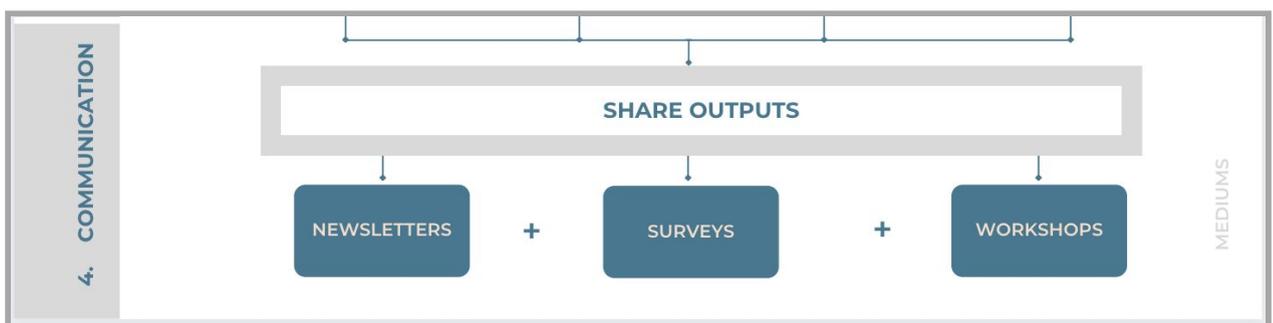


Figure 21: Visualisation of step 4 - share the outputs

A. Newsletter

A modern HTML newsletter offers the possibility to include survey modules and gaming elements to present the scanning results (e.g. signals in the spotlight) as well as insights gained during the sensemaking process. Further, it promotes engagement within your network or community and opens the possibility to communicate your results to a broader audience. Through regular events promoted in the newsletter, the scanning motivation can be held high, and new insights are constructed regularly.

Figure 22 shows a screenshot of the template used to produce an example of a newsletter containing content from the weak signal scanning, workshop results, as well as an interactive survey module.

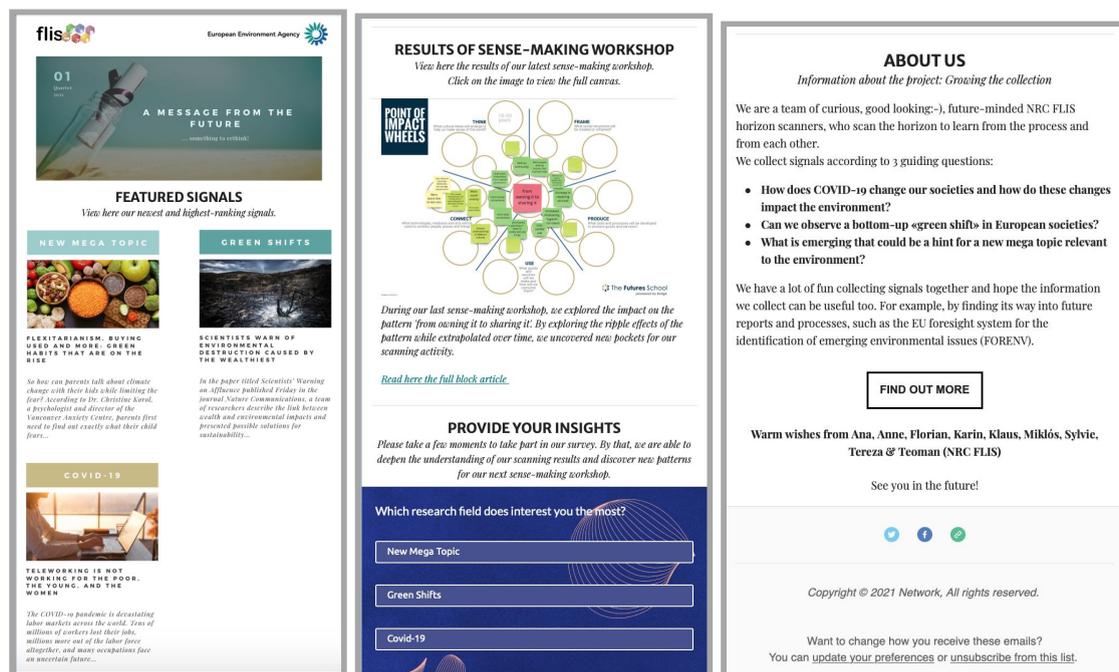


Figure 22: Example of a communication piece

B. Surveys

Surveys are an excellent opportunity to include a broader audience into the sensemaking process, e.g. by asking for an impact and uncertainty evaluation or identifying weak signals and emerging issues. Additionally, new insights can be gained by creating an ongoing Real-Time-Delphi process that recreates for every round a new survey with deepening questions.

C. Games & Workshops

We encourage you to facilitate ongoing Gaming the Future sessions that increase your network's creativity and pattern recognition capacities. Further, a bi-annual deepening workshop on conducting a CLA can help reframe the research questions and keep the motivation high amongst the research team; the results of these sessions can be included in the newsletter.

VII. What's next

We have come to the end of this guide, and you have read several times that Horizon Scanning is only one part of a holistic foresight process, though an enjoyable and important one. Horizon Scanning is in many cases the first step of a foresight process and is followed by several different phases, steps and exercises. A next logical step could be to start a Scenario Development process to design alternative futures; however, this is only one direction to continue. We encourage you to review the frameworks below to identify a possible next step for your team on how to further utilize the results of a horizon scanning process.

- **Generic Foresight Framework** [27]
- **Six Pillars Approach** [28]
- **Natural Foresight Framework** [12]
- **APF Competency Model** [29]
- **FTI Forecasting Model** [30]

Remember, the critical part of any foresight exercise is the conversations that happen throughout and in between. Do not dismiss that; always dig deeper and enjoy the journey!

VIII. Tools to use

To enrich and support your scanning practice, you may want to use available digital tools. There are comprehensive and licensed all-in-one tools explicitly designed for Strategic Foresight exercises on the market. However, in this section, we focus on freemium and open-source online tools that can be used to perform each task separately and make suggestions to help you with each step of the guide. You can find a detailed comparative analysis of these tools, including some additional premium or paid version tools, in the annex.

Tools for signal spotting

A. RSS Feed Reader

- **Flipboard** **FREE** was founded as one place to find the stories for your day, bringing together your favourite news sources with social content, to give a deep view into everything from political issues to technology trends to travel inspiration. <https://www.flipboard.com/>
- **Feeder** **FREE** - Add content sources to get your very-own customized news feed. Through advanced RSS integrations, we connect to almost any source on the web – blogs, news, weather, government databases, job boards, Twitter, newsletters and more. Just pick and mix. <https://feeder.co>

B. Social Media analyses:

- **Hootsuite** **FREE** - Enhance your social media management with Hootsuite, the leading social media dashboard. <https://hootsuite.com/>
- **TweetDeck** **FREE** is your personal browser for staying in touch with what's happening now. <https://tweetdeck.twitter.com/>

C. Trend databases

- **WEF's Strategic Intelligence** **FREE** - **Strategic** insights and contextual **intelligence** from the **World Economic Forum**. Explore and monitor the issues and forces driving transformational change <https://intelligence.weforum.org/>
- **Google Trends** **FREE** - is a service from Google that shows the number of search terms actually entered over time and puts them in relation to the total search volume. <https://trends.google.de/trends/>

Tools for signal scanning

- **Flipboard** **FREE** - was founded as one place to find the stories for your day, bringing together your favorite news sources with social content, to give a deep view into everything from political issues to technology trends to travel inspiration. <https://www.flipboard.com/>
- **Pearltrees** **FREE** - Save everything: web pages, files, photos, videos, notes. Save everything: web pages, files, photos, videos, notes. Create your collections and organize <https://www.pearltrees.com/>
- **Padlet** **FREE** - Even if you've never used any kind of productivity software before, Padlet is familiar and fun. · check_box Add posts with one click, copy-paste, or drag and drop. <https://de.padlet.com/dashboard>
- **Airtables** **FREE** (*Web Clipper only premium*) - is a low-code platform for building collaborative apps. Customize your workflow, collaborate, and achieve ambitious outcomes. Get started for free. <https://airtable.com/>

Tools for pattern creation & sensemaking

- **Padlet** **FREE** - Even if you've never used any kind of productivity software before, Padlet is familiar and fun. · check_box Add posts with one click, copy-paste, or drag and drop. <https://de.padlet.com/dashboard>
- **Miro** (workshop/whiteboard) - **FREE**: Experience the power of the #1 visual collaboration platform. Create, collaborate and centralize communication across your company. <https://miro.com/app/>
- **Mural** (workshop/whiteboard) - *paid only*: Combine different ideas and disciplines with your team to create something great. MURAL enables

innovative teams to think & collaborate visually to solve problems
<https://www.mural.co/>

- **Optional: Zapier** **FREE** (connect tools with each other): Automate processes without a developer. Workflow automation for large and small teams. <https://zapier.com/>
- **Loopy** **FREE** - with LOOPY, you can model systems by simply drawing circles & arrows, like a wee baby, remix others' simulations <https://ncase.me/loopy/>
- **Kumu** - **FREE** - Kumu is a powerful visualization platform for mapping systems and better understanding relationships. <https://kumu.io/>

Tools for communicating the outputs

A. Newsletter

- **Mailchimp** **FREE** - is an all-in-one marketing platform that helps you manage and talk to your clients, customers, and other interested parties. Our approach to marketing focuses on healthy contact management practices, beautifully designed campaigns, and powerful data analysis. <https://mailchimp.com/>
- **HubSpot's** **FREE** - CRM platform provides you with the tools needed to build and grow remarkable customer experiences that help spin your flywheel faster - <https://www.hubspot.com/>

B. Result Presentation

- **Padlet** **FREE** - Even if you've never used any kind of productivity software before, Padlet is familiar and fun. · check_box Add posts with one click, copy-paste, or drag and drop. <https://de.padlet.com/dashboard>
- **Airtable** **FREE** - (Gallery View) is a low-code platform for building collaborative apps. Customize your workflow, collaborate, and achieve ambitious outcomes. Get started for free. <https://airtable.com/>
- **Stacker** - **paid only** Turn Spreadsheets to Software - The most user-friendly platform for creating software without code. Create the tools you need from the data you already have. www.stackerhq.com/n

C. Surveys

- **Typeform** **FREE** - Turn Data Collection Into An Experience. Beautiful UX. Beautiful Designs. Easy To Use. High Completion Rates. Mobile Friendly. <https://www.typeform.com/>
- **SurveyMonkey** **FREE** - SurveyMonkey is a cloud-based survey tool that helps users create, send and analyze surveys. Users can email surveys to respondents and post them on their websites and social media profiles to increase response rate. <https://www.surveymonkey.com>

IX. Summary

This guide aims to provide you with a structured process of individual options to improve the Horizon Scanning capabilities to build resilience and manage the future. Besides offering a process, methods, and tools, this document also introduced concepts of Futures Literacy, including how to foster a Futures Mindset. It further emphasised the importance of the Horizon Scanning activities for Europe's environment and environmental policymaking. The step-by-step guide offers multiple frameworks, methods, and concepts to strengthen your Horizon Scanning capabilities. We showed various options for communicating your findings and which tools you can use to support your scanning activities. Nonetheless, always remember that there are no fixed rules on designing and running the Horizon Scanning process. We encourage you to adapt the process to your needs by experimenting with the methods presented and hack some of them to fit your purpose. Lastly, remember that all foresight activities are always run best in teams to welcome diversity and balance your own biases and assumptions about the future.

We hope that this guide has awakened your future spirit and that you and your team feel better skilled to explore the future, and we want to wrap up this guide with the following quote:

"The best way to predict the future is to create it."

- Abraham Lincoln

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ANNEX

A. Glossary

Horizon Scanning vs Environmental Scanning [1]

Environmental Scanning focuses mainly on current developments in STEEP factors and in our immediate environment outside of our control but in which we live, now. **Horizon Scanning** tries to identify the early rising weak signals that may evolve into emerging issues in the future but are not yet to be found in current-day research or media. Those emerging issues can then convert into trends over time, possibly with transformative consequences, or disappear without further notice

Weak Signal [31],[32]

Weak signals are emerging phenomena in the form of data points that indicate that significant change is underway. These can be changes caused by society, by demographics as well as technology, environmental changes, the economy, and of course human behaviour. Those changes that have not become trends, but that could become an emerging pattern, or a major driver. In other words, they are those **instances of change** that are perceived when looking beyond our immediate context. Weak signals are not obvious to the naked eye but have the potential to create significant changes both directly and indirectly, in the environment.

Emerging Issue [31]

Emerging issue is the result of an organic grouping or clustering of weak signals that, together, are gaining strength. However, emerging issues are not yet trends, and can die off easily as they are highly uncertain, but can easily become mainstream.

Trend [31]

A trend is the tendency or direction of a movement or change over time, is an **emerging issue** that has manifested itself enough to become a trend, as it is having impact in the surroundings. Trends have a **lifecycle** with different maturity levels, these can start strong or weak, overtime increase and eventually decrease; some are stable others have a short life. Trends are these events that are already occurring or have faded away, therefore are either in the present and some even in the past.

Pattern [31]

A pattern in the context of signals of change, scanning and Foresight should be understood as phenomena made up of the **manifestation of signals**. Also called patterns of change, these are mostly intangible **developments of transformation**. Bundling **weak signals** into a **pattern** leads to an **emerging issue**. A set of emerging issues can be clustered into a **trend** and finally a group of trends are categories either into a **megatrend** or **trend cluster**.

Drivers [31]

Also called **drivers of change**, a broad term for any force that causes change, whether brought about by people, organizations, or conditions (environmentally or else). Drivers are factors that cause change, that affect or shape the future. These developments can be *direct* or *indirect* depending on their influence or contribution to the outcome in the environment, in the system(s). Reason why they can also be called **contributing drivers**.

Wild Card [31]

A wild card is a highly unlikely yet highly impactful event. One that is surprising and unpredictable, and whose appearance will have **tremendous consequences** that can significantly change the present and the future. Wild cards should not be dismissed in a foresight process as these push **out-of-the-box thinking** that is necessary to address the new challenges and design new trajectories.

Black Swans, Grey Rhinos & Co [33]

Black Swans are events that are extremely rare but will have severe consequences that cannot be predicted and seem impossible until they occur. The difference between these and Wildcards is that Black Swans are not even on the radar, so truly unforeseeable.

White Leopards are hidden or camouflaged risks that are unpredictable but have large impacts with severe consequences - after they appear people assume they were predictable (hindsight bias).

Black Elephants are those events similar to the elephant in the room that nobody wants to see or talk about.

Gray Rhinos are used for events that move slowly, are obvious but often ignored, compared to Black Swans, they are visible but somehow tolerated.

Black Jellyfish are visible and known risks that unexpectedly escalate until the situation is out of control.

Megatrend [31]

A megatrend is simply put, a major or cluster of trends, on a **global or large scale**. Megatrends are these large forces which form slowly, but once manifesting, have a **substantial influence** over a wide range of areas. A force with the potential to affect the future in the long-term, over the next 10-15 years.

B. Tools - Comparative analysis

Scanning
Collecting
Sensemaking
Communicating

Tool	Features	Pros	Cons	Price	Free Version	Open Source
Brandwatch	Media Analysis. Crawls through Websites, Forums, Social media based on written queries and keywords.	Access to a great amount of data, many forms of visualization, very flexible with individual queries, API connections	Crawls only websites stored in the system, much unfiltered data, not intuitive, needs training	Price on request. Based on booked mentions ¹ per month.	✗	✗
Strategic Intelligence (WEF)	Collection of publications, interactive data on over 250 topics, regions and SDGs from several research institutions	Offers a good start for scanning and research in new topics, intuitive and nicely structured	Focussed on existing and proven data which thus contain less weak signals	Free version / 30€/month ² / 90€/month ³	✓	✗
FSC	Media Analysis (Monitoring) with pre-written queries. All-in-one foresight software.	Easy to use, reduced and filtered data, more qualitative data, comparable visualisations	Selection of sources (websites), less flexible regarding queries and visualisations, historic data only up to 2018	Price on request. Based on hosting type, booked modules, additional services	✗	✗
Pearltrees	Collaborative board for URLs, photos, files, notes. Elements can be organized and clustered freely.	Easy to use, responsive for collecting and sharing data	Lack of browser Add-ons	Free version / 3€/month / 5€/month / 10€/month	✓	✓
Padlet	Team collaboration software teams. Allows people to contribute anonymously. Admins can review the contributions before publishing.	Easy to use, commenting and rating features for collected data, besides data collection, it can be used as whiteboard, multiple ways to share and embed boards	In the free version, only 5 padlets are included, no browser add-on	Free version for up to five boards / 12\$/user/month	✓	✗
Airtable (Webclipper)	Browser Add-on to create records from your browser/web pages with a few clicks.	Many customisation and visualisation options for data, integration with other tools	Firefox not supported, most features are in the paid version	Free version/ Premium 20€/month	✓	✗
FSC (Webclipper)	Browser Add-on to create information (weak signals) from webpages with a few	Firefox and Chrome supported	Only available with a FSC license	Price on request. Based on hosting type, booked	✗	✗

¹ The queries have to be written according to the booked amount of mentions per month in order to last the entire month.

² Access to personal feed of emerging issues and trends and regular events and briefings

³ Access to unlimited transformation maps, pdf briefings, monitor emerging trends over time, monthly analysis of most relevant insights and trends

	clicks.			modules, additional services		
Flipboard	Social News Service for collecting articles and news in the form of magazines. Users can connect their Facebook, Twitter or Instagram contacts, follow feeds and share content with their followers.	Great for collecting news and RRS feeds in magazines. These can be shared and embedded on websites.	Does only support certain feeds and news.	Free	✓	✗
Miro (workshop/white board) ⁴	Collaboration platform for teams offering a white board to visualise processes, integrate external content (i.e., Airtable databases)	Real-time collaboration with many users, different levels of abstraction can be nicely visualised. Intuitive interface.	Free version offers only public boards	Free version / 8\$/month max. 20 users ⁵ / 16\$/month max. 50 users ⁶ / Enterprise 50 users above ⁷	✓	✗
Mural (workshop/white board)	Digital workspace for visual collaboration. Offers a wide variance of different templates. Integrations for Typeform, Zapier, Airtable	Real-time collaboration with many users, different levels of abstraction can be nicely visualised. Intuitive interface	No free version	12\$/month/member ⁸ / 20\$/month/member ⁹ / Enterprise ¹⁰	✗	✓
zapier	Connects different tools with each other, even those without official integration support	-	-	Free version / 20\$/month ¹¹ / 49\$/month ¹² more tariffs available depending on number of tasks per month	✓	✗
Padlet	Allows non-registered users to comment and rate a collection of entities (e.g., weak signals). New signals can also be added.	Easy, broad collaboration possible since no registration is required.	No filters, i.e., for metadata. Thus confusing with a large amount of signals.	Free version/ 10€/month/ 96€/year	✓	✗
FSC (foresight methods)	Creation of individual rating criteria and additional attributes to assess and analyse weak signals, clusters and in between connections.	Powerful filters and sortings to support large amounts of data.		Price on request. Based on hosting type, booked modules, additional services	✗	✗
Loopy	Tool for modelling systems by simply drawing circles & arrows, like a wee baby, remix others' simulations	Easy to use, intuitive tool to visualize complex causal relationships and share it with others.		Free	✓	✓

⁴ https://miro.com/app/board/o9J_lZZm3-4=/

⁵ Unlimited boards, anonymous board editors, exports.

⁶ Single Sign-on, Day passes for external collaborators.

⁷ Multiple team setup, advanced security settings,

⁸ Single workspace, unlimited visitors, full suite of integrations

⁹ Unlimited guests, single sign-on, priority support

¹⁰ Central admin dashboard, custom template creation, Enterprise APIs

¹¹ 1500 tasks per month, connection with 20 apps

¹² 2000 tasks per month, unlimited app connections

Kumu	Organize complex data into relationship maps with built-in metrics and clustering of elements	Easy to use and highly customizable	Free version limited to public projects	Free version ¹³ , 9\$/month/project ¹⁴ , 20\$/month/project ¹⁵	✓	✗
Stacker	View and comment on the Airtable data. A user portal can be set up for accessing, viewing, adding or commenting the pre-selected data. Surveys or other external URLs can be embedded	Airtable integration and visualisation of data on a dedicated platform	No cookie policy	50\$/month for 500 registered users	✗	✗
Airtable (Gallery View)	Provides a gallery view to share via a newsletter which provides the option to filter (without registration) and to copy and comment the data (after registration).	Share your weak signals via the gallery view or embedded on a website	No commenting functionality for visitors	Free version / 20\$/month ¹⁶	✓	✗
Typeform (Interaction + Survey)	Survey tool with options for integration of various sources (i.e., Airtable integration)	Offers various integrations, e.g. within newsletter	Limited to 10 questions in its free version	Free version / 30\$/month for integrated logic, unlimited questions and Airtable integration	✓	✗
Mailchimp	All-in-one marketing platform to manage and talk to clients or customers.	Create beautiful designed newsletter campaign	Free version limited to a few templates and mailchimp branding	Free version ¹⁷ / 10\$/month ¹⁸ , 15\$/month ¹⁹ , 300\$/month ²⁰	✓	✗
Hubspot (Marketing Hub)	CRM platform with tools and integrations for marketing, sales, content management and customer service	Create beautiful designed newsletter campaign, CRM, Marketing and Website builder in one	Complex settings and less intuitive than mailchimp	Free version ²¹ , 46€/month ²² , 823€/month ²³ , 2944€/month ²⁴	✓	✗
SurveyMonkey	Online survey tool for various use cases, i.	Intuitive administration and	Currently no airtable/miro/mura	Free / 39€/month ²⁵ /	✓	✗

¹³ For public projects (visible to anyone)

¹⁴ Includes one private project with unlimited collaborators

¹⁵ Includes one private project with unlimited collaborators, view-only users, custom branding, real-time commenting and activity feed

¹⁶ For admin users (premium version for integrations), collaborators and viewers for free

¹⁷ E-Mail, 1-Step automations, subject line helper, 1 audience, Mailchimp footer

¹⁸ Automations, E-Mail scheduling, 3 audiences

¹⁹ Pre-built journeys, journey builder, 5 audiences

²⁰ Custom coded templates, unlimited audiences

²¹ E-Mail Marketing, Contact website activity, reporting dashboard

²² Starts from 1000 marketing contacts, forms, bulk E-Mails

²³ Starts from 2000 marketing contacts, marketing automation, multi-language content

²⁴ Starts at 10 paid users, single sign-on, user roles, Email send frequency cap

²⁵ Unlimited survey items, access to all question types, 1000 answers per month

	e., customer feedback, including integrations and plugins	participation of surveys	API support (only through zapier)	99€/month ²⁶ / 30€/user/month / 75€/user/month ²⁷ / Enterprise ²⁸		
FSC (Reporting, Visualisation, Survey)	PDF and DOCX reporting of signals, trends, etc. Different visualisation types (e.g., radar, portfolio) and survey methods to include external users.	Combines the assessment, rating, visualisation and communication of weak signals and trends in one software solution.	Less flexible than single software solutions.	Price on request. Based on hosting type, booked modules, additional service	✘	✘

C. Templates

²⁶ 7500 answers per month, removes SurveyMonkey branding

²⁷ API support, white-label surveys

²⁸ Price on request. Own customer support manager

SOCIETY

Which social changes can you identify?

TECHNOLOGY

Which new technologies are emerging?

ECONOMY

Which factors are impacting the economy?

ENVIRONMENT

Which factors are impacting the environment?

POLITICS

Which policies or regulations are pushing or holding back the future?

VALUES

Which value shifts can you observe?

FRAME

What social structures will be created or reframed?

THINK

What cultural ideas will emerge to help us make sense of the world?

CONNECT

What technologies, mediums and arts will be used to connect people, places and things?

PRODUCE

What tools and processes will be developed to produce goods and services?

USE

What goods and services will we make and how will we consume them?

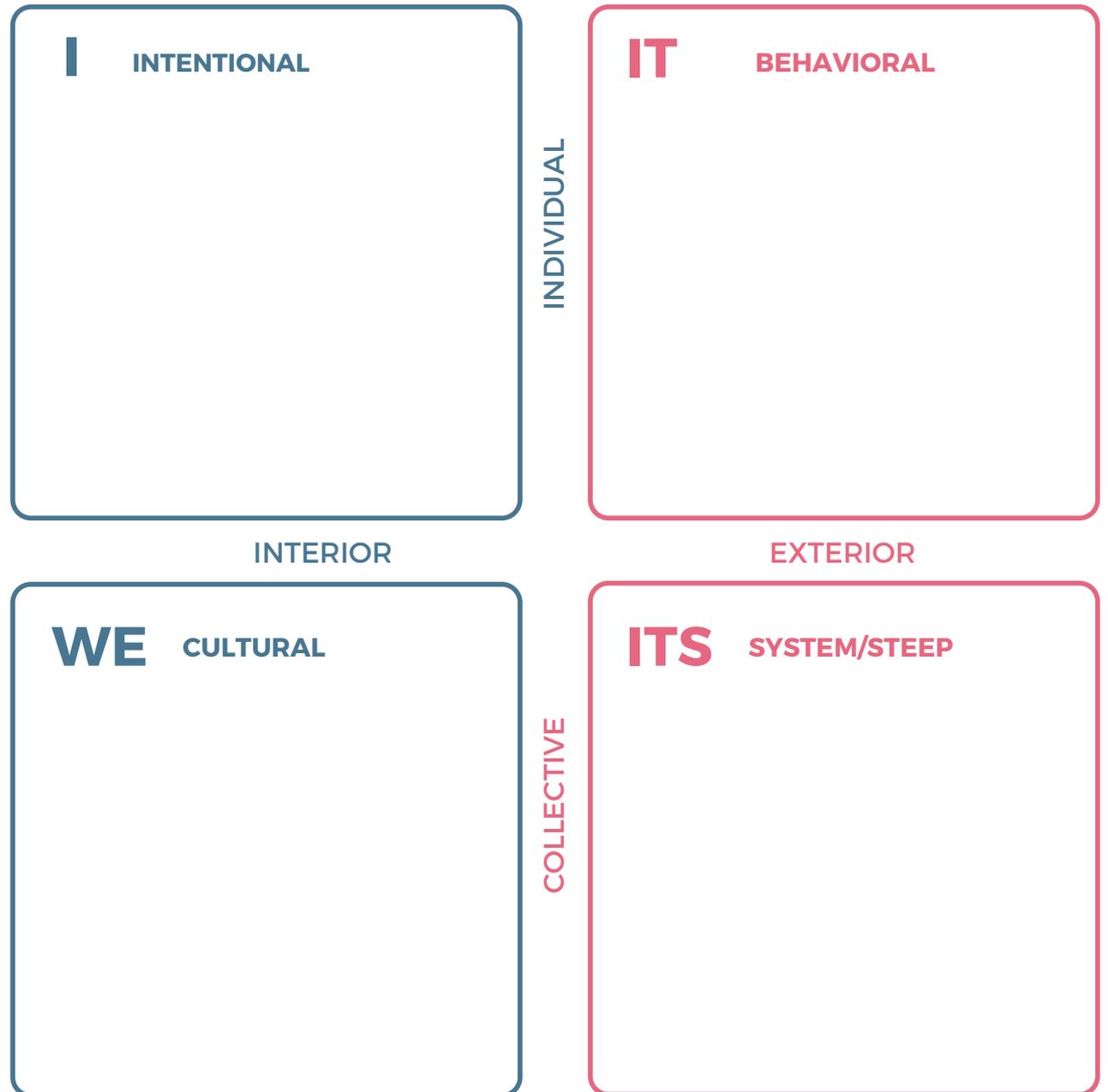
INTEGRAL FUTURES FRAMEWORK

FOCAL ISSUE



GUIDING QUESTIONS

- **INTENTIONAL** - What feelings, hopes, dreams, intentions, beliefs, thoughts or values have shifted?
- **BEHAVIOURAL** - What individual behaviour, how we act and react due to our education, cultural background or intelligence has changed?
- **CULTURAL** - Which collective cultural shifts, new myths and worldview have arisen that influence our stories and traditions we have grown up with?
- **SYSTEMS (STEEP)** - Which social, technological, economic, environmental or political shifts in our systems have occurred?





THE MAD HATTER

FULL SPECTRUM OF VIEWS

FOCAL ISSUE

Empty rectangular box for the focal issue.



BE POSITIVE
Empty rectangular box for positive views.



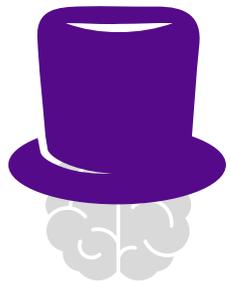
FOCUS ON NATURE
Empty rectangular box for nature focus.



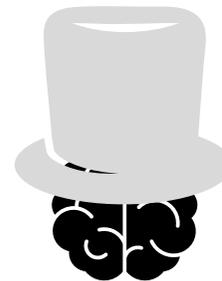
BE NEGATIVE
Empty rectangular box for negative views.



FOCUS ON FEELINGS
Empty rectangular box for feelings focus.



BE PLAYFUL
Empty rectangular box for playful views.



FOCUS ON FACTS
Empty rectangular box for facts focus.

FRINGE SKETCH



CIPHER FRAMEWORK

C

CONTRADICTIONS

Examples that demonstrate opposing or incongruous forces at play simultaneously

I

INFLECTIONS

Occurrences that mark a major turning point or establish a new paradigm

P

PRACTICES

Emerging behaviours that are becoming more pronounced or gaining in popularity

H

HACKS

Inventive, unintended uses for tools, technologies, and systems

E

EXTREMES

Instances of technologies, functions or concepts being pushed to new limits that might change the nature of their use

R

RARITIES

Highly unlikely or unexpected events and phenomena; Black Swan events

WEAK SIGNALS

1 What is novel and surprising?

2 What is increasing or decreasing?

DRIVERS

3 What are the issues which may start emerging?

4 What is needed and therefore can be expected (STEEP)?

TRENDS

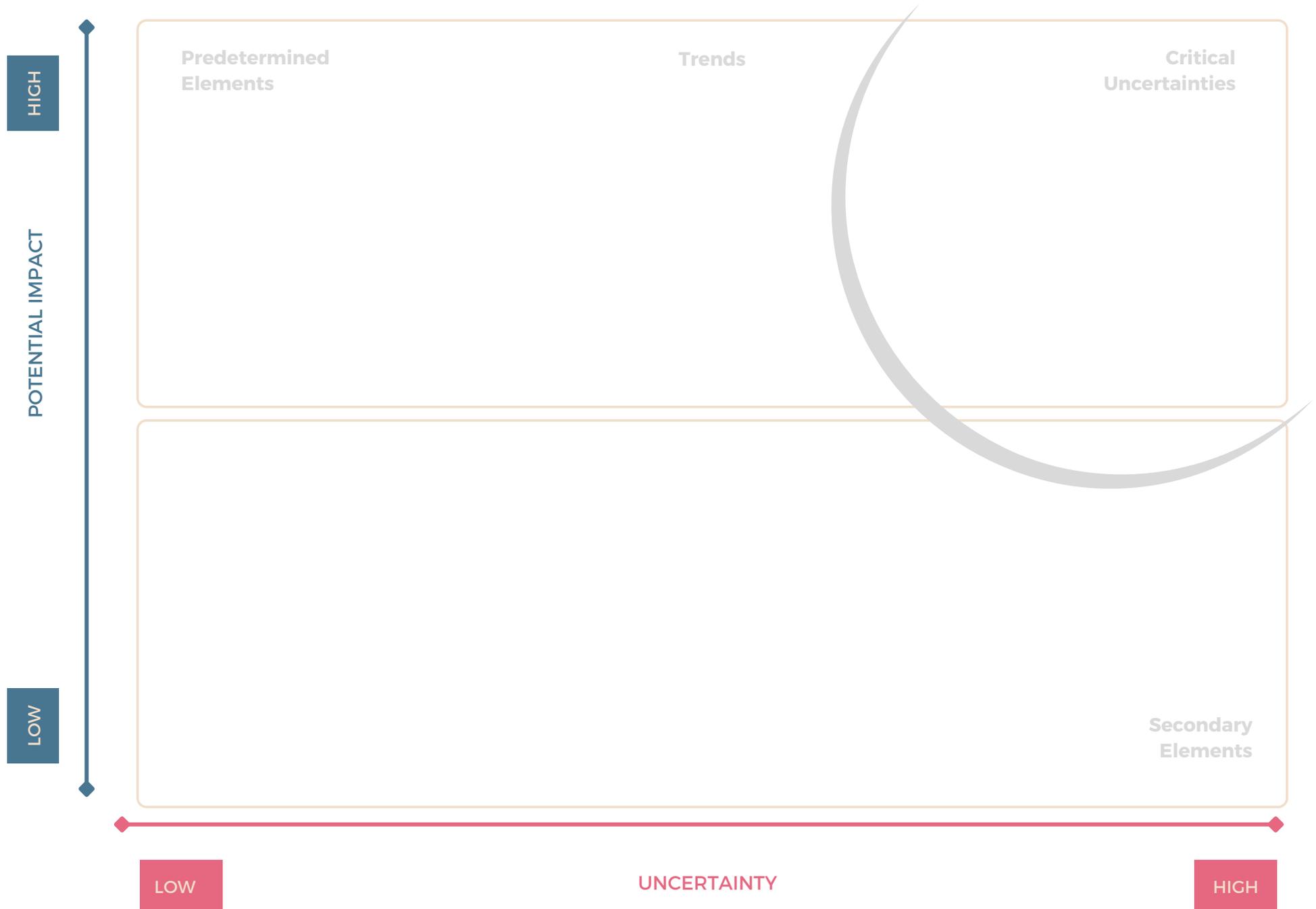
5 What slows down or prevents the emerging change?

6 What are observable megatrends?

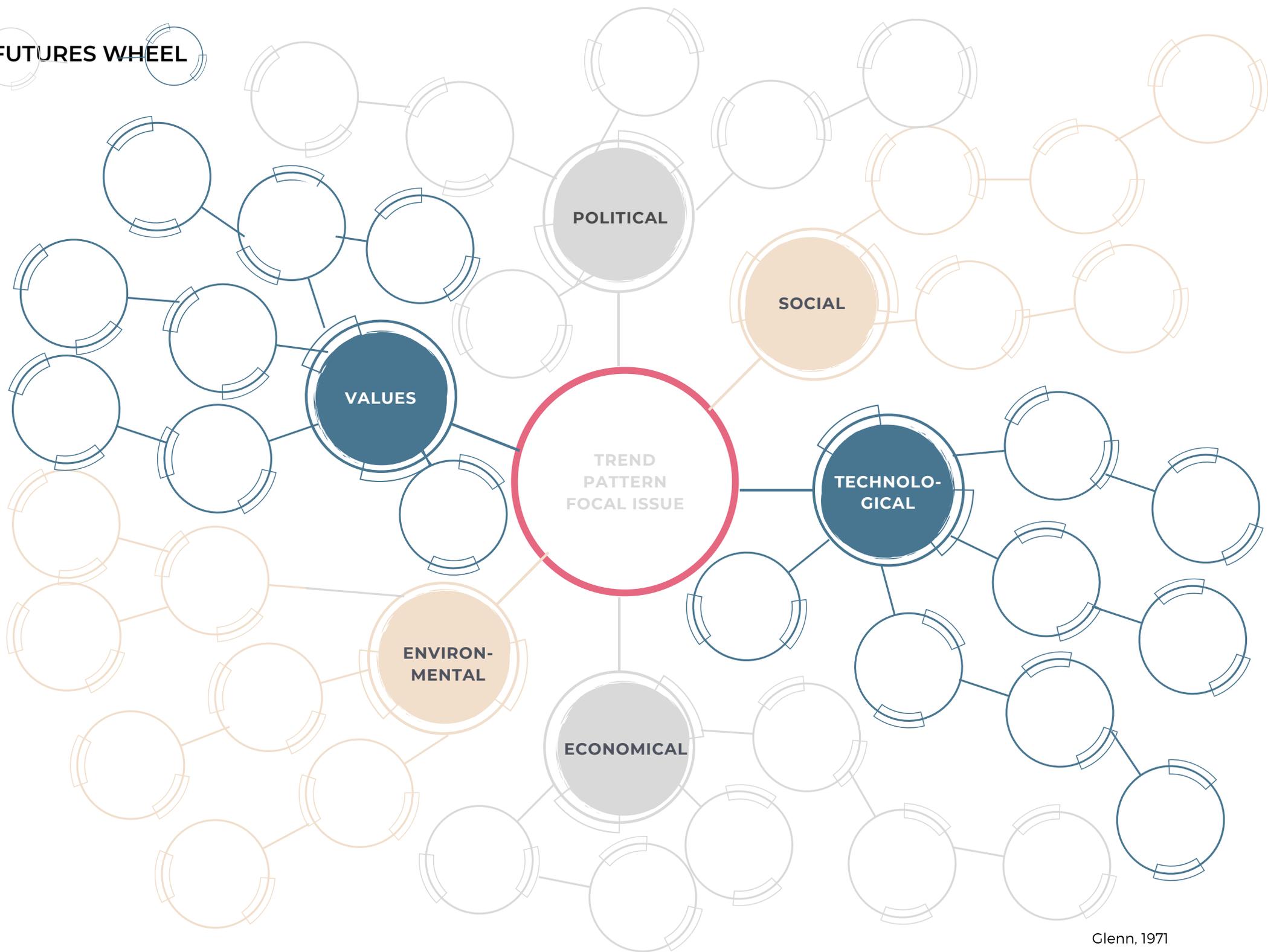
DISRUPTORS

PROMOTERS

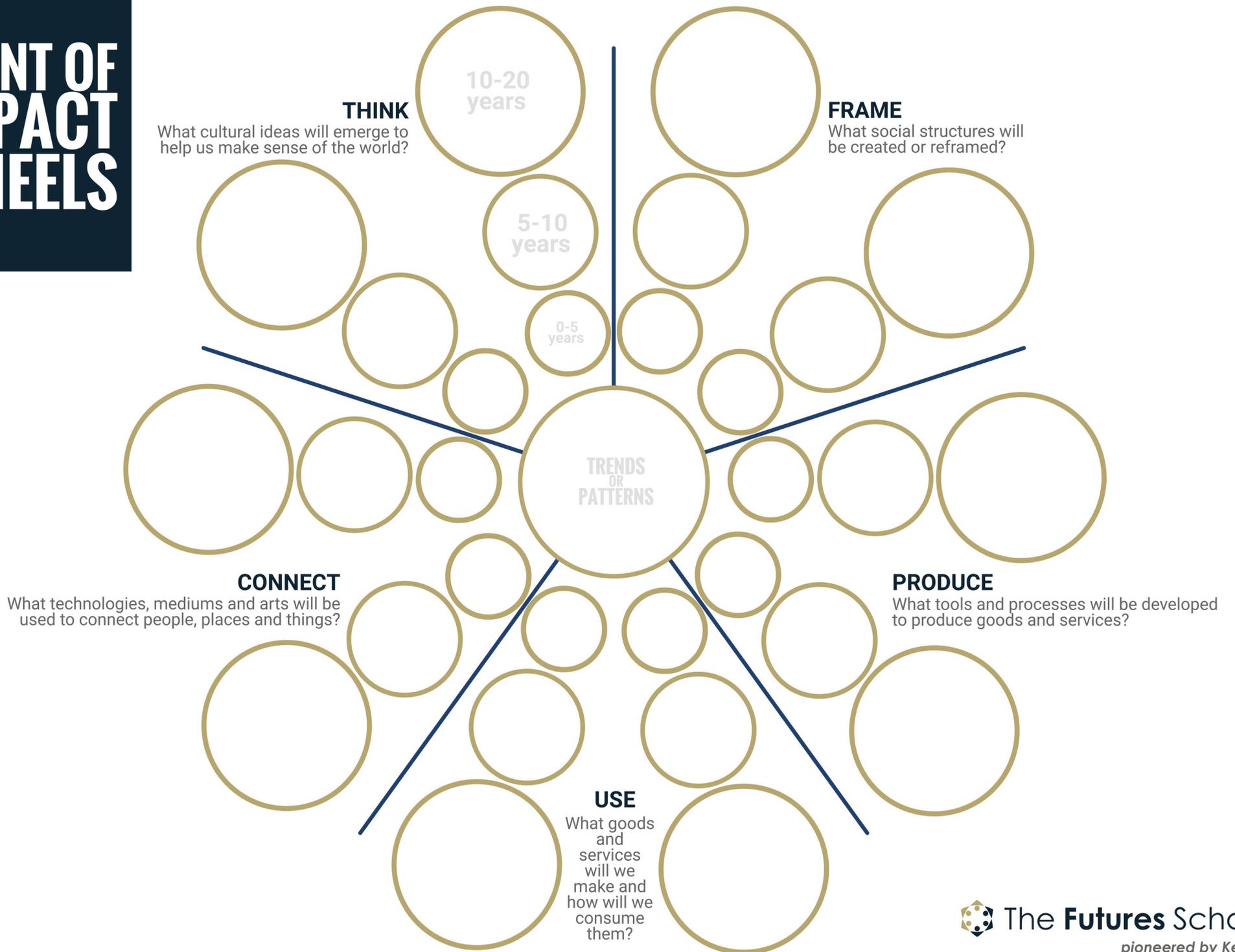
IMPACT UNCERTAINTY MATRIX/GRID



FUTURES WHEEL



POINT OF IMPACT WHEELS



CAUSAL LAYERED ANALYSIS

EXISTING

TRANSFORMED

Empty rectangular box for existing state.

Empty rectangular box for transformed state.

Empty rectangular box for existing state.

Empty rectangular box for transformed state.

Empty rectangular box for existing state.

Empty rectangular box for transformed state.

Empty rectangular box for existing state.

Empty rectangular box for transformed state.

LITANY

SYSTEMS

WORLD
VIEWS

METAPHOR