RECOMMENDATIONS FOR

MANAGING WEAK SIGNALS

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CLUB DE PARIS
DES DIRECTEURS DE L'INNOVATION

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MJV people transforming business

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1. INTRODUCTION

Theorized by Igor Ansoff in the 1970s, the concept of weak signals was later developed by various authors, including Philippe Cahen, who was awarded the *prix de l'Intelligence Economique* in 2011. This is a subject that is still not well known, as its usefulness and applicability in the context of enterprises remains rather unclear.

In a world where things are moving faster, where the market shares gained today will be threatened tomorrow, many companies and innovation leaders are highlighting the strategic importance of weak signals. This subject can have real added value for decision-making notably because it is crucial for preparing for the future, anticipating trends and major changes, reducing uncertainties, identifying the unexpected, taking advantage of opportunities and preventing potential disruptions.

However, many obstacles prevent the optimal deployment of a weak signal management strategy within companies. These obstacles may be linked to:

- **company culture**: insufficient maturity level, immobility of the structure, difficulty in engaging the strategy on distant issues, technical tradition
- **time constraints:** long production cycles, time-consuming activities, lack of human resources, difficulty in giving continuity to the project
- **financial:** complexity in calculating return on investment, costly technologies
- **technical:** poor decoding of information, internal competition in the transmission of information
- **state of mind:** blind spots, wishful thinking, difficulty for senior management to accept an information system from a qualified and potentially contrasting information system in relation to the company's strategy, difficulty in accepting sources with no hierarchy

This subject also holds significant importance for risk managers and senior management, who can be more prescient in protecting their companies if they build the capacities to make sense of weak signals. This includes external weak signals, announcing dramatic changes of market conditions, as well as internal weak signals, which may be symptoms of potential large operational failures.

The "Club de Paris des Directeurs de l'Innovation" working group is fully convinced of the importance to manage weak signals in a company environment, which is more and more competitive. Therefore, we have decided to share experience across our different core businesses and develop a white paper to leverage awareness and foster a practical approach to managing weak signals in other organizations

This document is a first version and will be upgraded with Club members' remarks, comments and testimonies.

2. WHAT IS A WEAK SIGNAL?

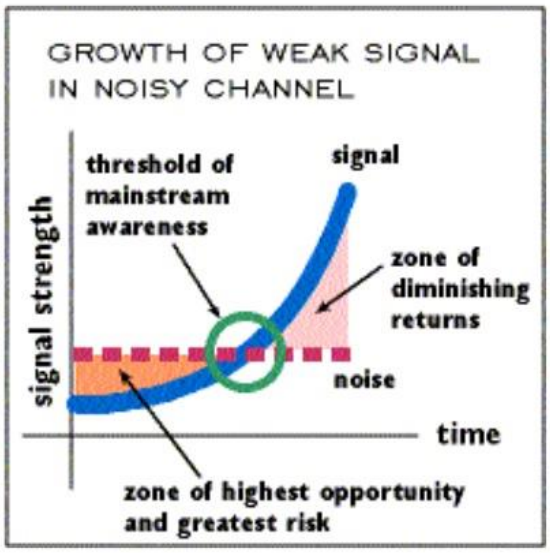
Defining the characteristics of what we call a weak signal will enable us to establish a clear basis for developing the approach. While the definition varies between individuals and their sectors of activity, the point of convergence is the following.

A weak signal is an existing thing or phenomenon that can be interpreted as an indicator of potential greater change. It is useful to consider a weak signal as having three components:

1. The thing or phenomenon itself.
2. The signal – the news items, photo, service, object, story or event that describes the subject.
3. The interpretation, which refers to how the signal is received, how it is linked to the interpreter's own view and worldview and how it is used.

Weak signals comprise the following characteristics:

- **Novelty:** a weak signal is an indicator of something new or a new perspective on a known subject
- **Surprising:** a weak signal is surprising to its interpreter
- **Challenging**: a weak signal forces one to challenge existing assumptions and is therefore often difficult to detect or easy to overlook
- **Significance**: a weak signal describes something that may have an impact on the future
- **Delay:** a weak signal describes something that is not yet significant but requires time to mature



Coffman 1997
http://www.mgtaylor.com/mgtaylor/jotm/winter97/wsrmatur.htm

3. HOW COULD IT BRING VALUE?

In our discussions, we found that our companies use three different approaches to exploit weak signals, with the possibility of combining them.

We thus consider that the weak signal can be used as **a trigger** for an early-warning system, **as an answer** to a pre-defined question, **or to monitor a stage,** according to the strategies previously defined.

- The weak signal is used as **a trigger** when collected by the information detectors put in place. Once identified, it will be analyzed, interpreted, cross-examined and possibly integrated into an action plan. The process is therefore triggered by the identification of the weak signal.

- Another approach is to seek to identify the weak signal from a previously asked question. This can take the form of an internal solicitation, for example, and the objective of this weak signal search process will be to **answer** this specific question.

- Finally, one can also **monitor the stage** of a pre-identified phenomenon, which will serve as validation points for a strategy already initiated. If the weak signals grow in a way that supports the strategic axis, it may be appropriate to pursue and accelerate development. If instead there are weak signals that run counter to established objectives, it may be necessary to re-evaluate all, or part, of the strategy initiated.

It is important to note that a weak signal is not relevant in itself, unless it is considered in the two following perspectives:

- **In the global ecosystem:** Different tools exist which could be helpful such as
  - **PESTEC** Analysis (**P**olitical-**E**conomic - **S**ocial – **T**echnological - **E**nvironmental – **C**ultural signals)
    - Political, Economic, Regulatory environments, evolutions, indicators
    - Societal trends and networks
    - Technology trends and clusters
    - Domain applications
    - Customers and suppliers
    - All stakeholders supporting or interfacing with the domain activity

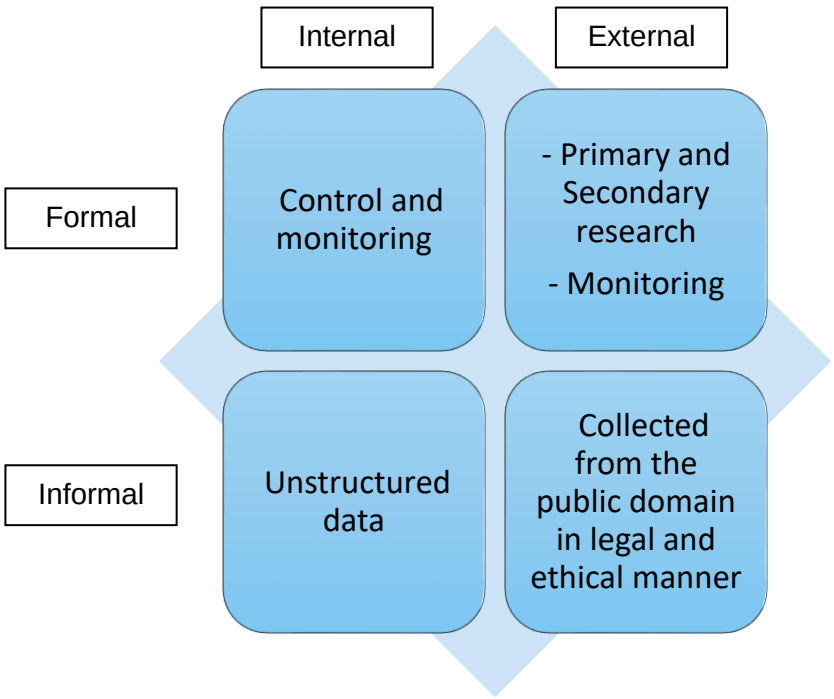
  - **Porter's Five Forces** (Key players)
    1. Threat of new entrants: other companies who want to move in adjacent fields, i.e. GAFAM, startups...
    2. Bargaining power of suppliers
    3. Bargaining power of customers
    4. Threat of substitute products
    5. Rivalry among existing competitors: competitors with their products, strategies, governance, partners

- **With respect to the company strategy** (short, mid and long term)

4. WHICH INFORMATION TO COLLECT AND HOW

The first step in identifying weak signals is to put in place appropriate information gathering sources (or sensors) which are the most relevant for the company strategy. It is equally important to insure this the data or information captured is gathered in a specific information system in the company, which would help centralize, store, crosschecked and analyze the data. The system must however be flexible and evolve with the context.

With respect to weak signals, it can be helpful to consider different types of information sources along with the collection approaches relevant to them:



This information can be collected through some of the following methods and tools:

- Set up internal networks of collaborators/experts to collect information on a regular basis, based on legal and ethical protocols
- Ideation workshops
- Monitoring tools: financial flows, investments in startups, financing budgets…
- Pay access to databases: competitive intelligence platforms, scientific publications, patents…
- Subscribe to newsletters, publications…
- Scan the web
- Attend congresses, conferences, webinars, workshops…
- Launch ad hoc studies with external vendors compliant with SCIP guidelines: Competitive Strategic Intelligence Agencies
- Launch Learning Expedition (LEX) on a specific topic with precise objectives
- Publications of experts such as World Economic Forum, UNESCO

- Recourse to Open Innovation Knowledge Brokers

The following are testimonies about four methods used for gathering potential signals:

Scanning Through Patent Databases

Testimony about the method from Frédéric Caillaud,
Institut **N**ational de la **P**ropriété **I**ntellectuelle (INPI)

- Weak signals: New patents “islands”
- Source: Patent data base
- Action: use the tool to detect the emergence of a new invention made by any public or private entity anywhere throughout the world

“A patent is one of the earliest markers of innovation. Most of the information it contains is not available elsewhere. Extracting suitable information from a data base of 130+ millions of patents is a complex and challenging task for most of the companies. Patent analytic tools are now making it possible to create ordnance maps of all the technologies that are developed.

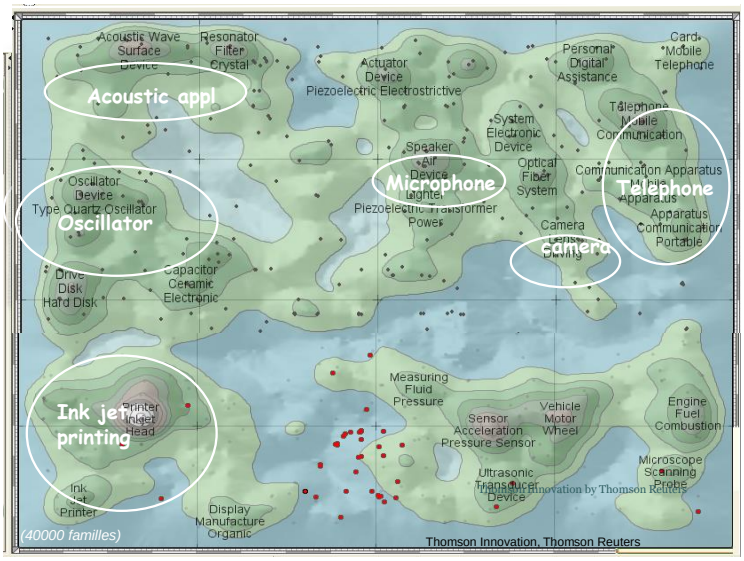
One of the best software’s for this has been developed by Clarivate Analytics. This tool uses the Derwent World Patent Data Base, which is unique as the patent abstracts are rewrites (in English) by experts with identical defined semantics. The semantic distances between the patented inventions are then calculated and the results are visualized on a topographical map where the relief shows patent density. The patents are positioned across the map close to similar patents.

This tool's appeal lies in its currently unrivalled visualisation of the information contained in an extensive corpus of patents. In practice, it displays mountainous islands in the middle of the sea. The higher the patent mountain, the denser the innovation in this field. The closer one mountain or hill is to another, the more similar the subjects dealt with in the patents. By reading the key words on each mountain one can determine the patents' scope of application. Just like Google Earth, we can zoom in on regions of interest, from an entire sector right down to the researcher.

If one performs a regular analysis of the patents filed in a given sector, one can detect innovations through the progressive emergence of an island (rapid increase in the number of patents located in the same area of the sea over time). The objective of the query was the detection of a new cosmetic application from an analysis of the piezoelectric sector (40 000 inventions). These two sectors are supposed to have nothing in common, but not only is an island forming (patents in red), but one of the patents has already led to a product launch in the cosmetic field.

Patent analytics and patent mapping are very efficient to identify the weak signals whatever their country or sector of origin. This tool is complex and expensive, but SMEs could visit the

website or contact the French patent office (INPI) and arrange for a detailed study to be conducted rapidly by experts in the field and at cost."



Courtesy A. Mazzuccoteli, L'Oréal

Monitoring social networks

Social networks can be viewed as a significant source of information as they gather feelings, emotions, feedback from a large range of users.

Testimony about the method from Patrick Valaix, PSA Peugeot Citroën

- Weak signal: The emergence of social movements in France
- Source: Social media and the Internet
- Action: Developing the "human push" approach

"The PSA group has a central marketing team focused on social trends identification based on many sources of information. The added value of these observations is achieved by structuring the signals received, weak or not. Thus, this "social observatory stuff" has been transformed into four worldwide transformation axes, five main social trends including drivers and expectation vectors about automotive product and mobility.

Our challenge is to convert and update these data from societal level to input data for product and service plans. It is done by crossing viewpoints and is more than useful for innovation purposes regarding our typical cycle time of six years between the first idea of innovation and the market launch. Also, for instance, orientations toward configurable cockpit ambiance (light, sound, i.e...), air quality management, easy to use features, mobility services were detected more than 10 years ago.

We called this shared approach 'human push' to balance the eventual 'pure techno push' approach."

Relaying field information

Capturing information, interpretations and personal insights by operational employees, is one of the most powerful yet often neglected methods for identifying weak signals.

Testimony about the method from Siham Haroussi, Malakoff Humanis

- Weak signal: Rapprochement of two competitors
- Source: Field information relayed by employee
- Action: Taking a closer watch on a partnership

"We had an instance when certain weak signals had been identified and which indicated a rapprochement between different groups. The source was field information relayed by a regional magazine, which gave rise to the first alert.

The information concerned was an event organized by two entities which had absolutely nothing to do with one other. It suggested that there were premises for a stronger partnership, especially since it was on a subject on which we don't look for partners in our sector. It was truly a sign of an important partnership. This early signal allowed us to dig deeper and then be more vigilant in terms of monitoring the actor in question.

With this information in the background, we interpreted other elements differently. Other events were given a different weight, and this enabled us to anticipate a much stronger partnership up to the point of rapprochement."

Brainstorming with diverse internal experts

The methodology consists in bringing together internal collaborators from diverse backgrounds (marketing, product development, innovation, strategy, finance, IT) to benefit from a large range of expertise in order to share, discuss, challenge, analyze the collected information and assess its interest for the company (technology….).

Testimony about the method from Olivier Coppin, Faurecia

- Weak signal: New technology (electrolyte)
- Source: Creative sessions
- Action: Setting up a monitoring team

"Long ago, in a previous life, we were facing the tremendous issue of charging time for electric vehicles. Charging time directly defines use conditions and thus the acceptance of electric vehicle. It also impacts, as a vicious circle, the design of the vehicle. To make it simple, when the charging time is long, the user expects a long range to lower the need to charge often and the risk to run out of power. But a longer range, requires a bigger battery capacity, and thus a

longer charging time!

To address this challenge, we organized some creativity workshops to combine all the inputs we could. The group consisted of technical experts, battery research specialists, vehicle users and energy providers. During one session, we tried to keep away the context and constraints of electric devices to re-invent the vehicle user's life and try to identify his real deep expectations. One scenario naturally appeared as the 'no change in current use', meaning to 'refuel' the vehicle for a new full range in less than 5 minutes, go to a charge/fuel station, use an easy (light, small) link between the charging station and drive away.

We then tried to define all the possible ways to exchange energy between the charging station and the vehicle. One of the possible options of using liquid exchange naturally came out. We then identified a possible scenario of being able to charge a battery by changing its electrolyte. The goal was to "regenerate" the battery by renewing the electrochemical properties of the liquid driving the ionic exchange of the battery and thus renewing its energy. This scenario was described as deeply as possible and became one of our information criteria alerts for technological and scientific publication scouting. We were thus able to detect some fundamental publications on battery types allowing this type of charging. It was then a low maturity level topic of course, but we were able to monitor it and to follow its evolution. At this stage, the objective was only to be able to detect signals and to feel the possible trend and maturity evolution. This field was one of the external observation criteria to detect and follow the topic. Our battery specialists analyzed the information flow and integrated it in their expertise field.

We were able to detect and identify the scientific labs working on such technologies and later the first experimentations around it. We also identified some competitors and battery technology leaders following the topic or working on it. As of now this solution is still not a real alternative to the batteries currently used, but some SMEs are using it in real use float experimentation and have had some interesting results.

What are our benefits? Since we started monitoring this field early enough, we were, first, not shaken awake by the developments, which would not have been an optimal situation in a competitive world, and were able to analyze regularly the progress, or not, of the technology. We are also able to analyze the results and their relevance with greater depth to make our internal conviction and decision. We are also able, if needed, to launch quickly our internal development, knowing the best contacts and actors to mobilize. Besides, this lead gave us the opportunity to assess the business context and opportunities given by such a solution."

Testimony about Sanofi Pasteur detecting new breaking news on the radar screen

- Weak signal: a unique published information on a competitor's intentions regarding industrial investment
- Source: published information detected by a monitoring platform
- Action: integrate new production capacity investment of one major competitor in Sanofi Pasteur forecasts

"A few years ago, in the framework of the H1N1 pandemic, and thanks to our global monitoring system, we captured information in a short article telling us that a competitor was about to invest very significantly in the construction of an industrial site.

This company being a multinational, the choice of the country could be made in any geographical area. The article mentioned a few countries and geographies that could host such an investment. In addition, it seemed that state subsidies would be likely to guide the investment decision. Only one article reported on this project, without the possibility of cross-referencing the information with other sources.

Taking these pieces of information into account had made it possible to orient research and set up monitoring in a certain number of target countries. Rapid research on state support systems for industrial investment in these countries was thus able to be set up to refine the monitoring strategy. Five countries and geographic areas have thus been defined as targets.

After a few weeks of monitoring, the information collected made it possible to refine the strategy and to distinguish municipalities likely to welcome such investments located in pharmaceutical hubs. The installation of alerts on the websites of the cities concerned quickly provided access to documents describing this investment in a US state.

This is a typical case of the capture of a weak signal because all the dimensions of the definition mentioned above are met:

- *New: new investment announced in a local newspaper; unique and isolated information, impossible to crosscheck*
- *Surprising: by the size of the investment*
- *Challenging: it required a re-interpretation of the bundle of hypotheses*
- *Meaning: because this factory had a significant impact on the quantities of products manufactured at global scale in a pandemic situation*
- *Delay: the monitoring was spread over a period of a few months to allow the signal to turn into a strong hypothesis.*

The key success factor of this action was an accurate and performing monitoring system, a well-prepared analyst, a long-lasting effort to follow up the global view as well as a deep dive on the competitor's strategy understanding."

Scanning the Web

The methodology consists in scanning the web for available information that enables the identification of weak signals that are precursors of relevant changes in trends, markets, technology, competition, regulation, prices, etc. The information is then processed and condensed in order to facilitate an informed decision making for stakeholders.

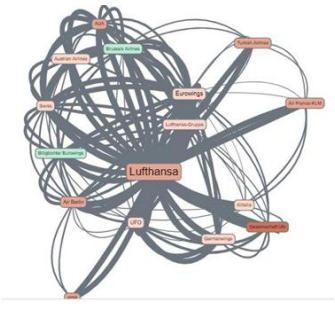
Testimony about the method from Peter Poppe / Tobias Lassmann, BNP Paribas

- Weak signal: News about industries or customers
- Source: Regional / Local newspaper articles
- Action: Building a tailored tool to monitor relevant industry trends and customers

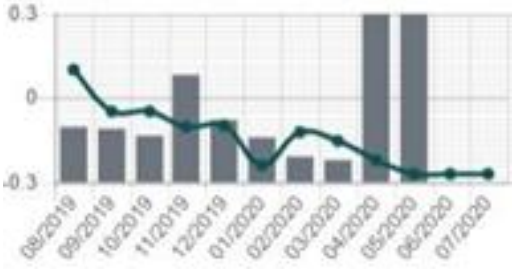
"In our SME credit portfolio, the creditworthiness of individual customers can change unexpectedly and dramatically. Further, certain industry trends (e.g. growing e-commerce, disruption in the automobile industry) may severely impact the creditworthiness of an entire sub-portfolio, e.g. customers in the same industry. The goal of this project is to identify weak signals on customers or industries that can affect their creditworthiness.

TIMon, our weak signals detection and monitoring tool, is designed to crawl hundreds of regional newspapers in Germany, scrape the articles to identify those related to customers and topics we want to monitor. The platform algorithm allows searching for a customer and analyzing the development of the articles' sentiment in the media coverage over time. Furthermore, word clouds will enable the analyst to quickly identify the key messages. An additional network graph shows related companies, their importance in the media and their sentiment. The calculated overall score enables the definition of trigger events and alerts to implicitly monitor thousands of customers, sending out warnings to the users when adverse news are detected.

Within the topic monitoring, only a handful of keywords on that topic are required, as those will automatically be expanded to a comprehensive list of related keywords that are altogether used in the search for related articles. The simple implementation of a topic monitor enables a strategic analyst to define several topics to follow up on causality chains. For example, a growing and positive trend of the e-commerce may support the business of big logistic companies like DHL as well as their subcontractors. However, Amazon's ambitions to insource delivery tasks, maybe even using drones in future, will counteract their success. TIMon enables the analyst to derive key messages from both topics and analyse their effects on the credit portfolio.



Network Graph of related entities



Sentiment curve and number of identified articles over time.

Words cloud on company indicating takeover rumors

5. HOW TO IDENTIFY A WEAK SIGNAL

The characteristics can help identify a weak signal:

- It is a unique fact, data, information
- An unexpected information
- With potential impacts (+/-) on company strategy in the short, medium or long term
- Can come from diverse sources: array of presumptions
- Information that needs to be captured, cross-checked, analyzed, interpreted

Human Interpretation

Human interpretation makes it possible to integrate a more global view of the ecosystem, and to cross-reference other elements such as trends and strategy, in order to link elements that seem independent. This includes an element of intuition and interpretation that is not automatic.

BOX: *How to prioritize/categorize weak signals*

In most companies there is no organized categorization of weak signals. Relevance can be assessed in several ways:

- ***Technology axis:*** *To explore what can be done with it. Is it a technical field that is opening up, or is it simply a different technology that will prove costly without bringing anything new in terms of use?*
- ***Business Opportunity :***
    - *Do we know how to make something of it directly, in our usual ways and customs?*
    - *Do we know how to make something of it, even with a technical or market or business revolution, in our traditional field of application?*
    - *Are we building a parallel path that can broaden our scope or business?*
    - *Is this something that strikes at right angles to our activity?*
- ***Degree of urgency:*** *Is this a short-term trend? In 5, 10, 15 years?*

Testimony about the method from Antoine Nguyen, UX designer, specific listening on Covid-19 crisis

- Weak signal: “Web listening” after President Emmanuel Macron’s speech announcing the lockdown in France
- Source: Twitter
- Action: Identify the impact on consumer habits

“The day after President Macron’s speech announcing the lockdown for France, the first step

consisted in identifying the most relevant macro-trends, which are topics with a lot of comments. At the beginning of the study, no one could predict what would be the popular feeling and what would be the consequences. This use case is about an unprecedented event which implies unprecedented reaction, change and transformation. Thus, there was a need to put in a place a new 'sensor' to capture early signals of these changes.

The information was collected from Twitter and initial data processing allowed highlighting topics and their relative weight in terms of volume and relevance. By aggregating the first tweets, three main trends were identified:

- *the evolution of consuming habits*
- *questions around purchasing power*
- *the need to leave home for holiday*

On a second stage, the aim was to refine these macro trends in order to have a deeper analysis. Specific attention was paid to verbatim in order to understand well what the consumer wants. After one month of observation, the first conclusion was very meaningful for retailers: the consumer wants to purchase hyperlocal products instead of organic or products "Made in France".

This data was processed by Semdee using unsupervised machine learning. Then trends are connected to the context and processed with human inputs. Each signal could have a different meaning depending on the business, sector or people involved in the study.

Monitoring trends to identify weak signals depends not only on the context and the algorithm, but also on human intelligence to give sense to the results. The next steps would be to assess how signals are evolving and whether the trends are growing or not."

To go further:
https://www.linkedin.com/pulse/la-plateforme-de-cognition-artificielle-my-knowledge-franchit-hoarau

6. HOW TO MANAGE A WEAK SIGNAL

The objective of this level of action is to link analysis and interpretation of an identified weak signal with the strategic, tactical and operational needs of the organization. In order to effectively put in place a system to manage weak signals, it is recommended to:

- Be open to information, ideas and interpretations from all levels of hierarchy and all parts of one's ecosystem
- Track and trace: date, context, circumstances, people involved…
- Assess the relevance of information and reliability of the source
- Store the weak signals and be able to retrieve it along the analysis process

It is also important to know:

- Whom within the organization must I inform or alert in the company?
- Who is responsible for analyzing it and putting it in the perspective of the global picture within the organization in order to identify information synergies?
- How should this weak signal be monitored? Which are the key indicators to follow?
- To whom and how to communicate its evolution? (executive summary, background paper, briefing, strategic recommendations etc.)
- When does it become a strong signal? → when it supports the SWOT analysis
- How can the identified signal be integrated into strategic foresight and future scenarios?

7. SEVEN RECOMMENDATIONS BASED ON EXPERIENCE

These recommendations are designed to structure the approach well, make it effective and impact on the company, in order to have real operational benefits.

1. Be attentive and open-minded

A weak signal is above all a signal that is likely to go unnoticed.

One should be wary of the idea that signals are in themselves weak, as if the only question was one of amplitude and detection. There are things that are hard to detect but can definitely be detected with the right instruments. The real problem is one of attention rather than detection.

For example, the financial crash of 2007, of which it has often been said, after the fact, that no one had foreseen it. That is totally wrong, because many people had anticipated the crash. There were financial market indicators on the liquidity of derivatives that were well known and published. The problem is that no one paid attention to these signals. Whether they were weak or strong is rather a question of definition, but they can be **considered weak if they did not engage the attention of those who should have been listening to them.**

Nevertheless, it is important to challenge the reliability of the information and its source.

2. Don't get overwhelmed by information

The system developed must be in line with the company's strategy, allowing the construction of a flexible model that recognizes its own limitations, in order to identify and prioritize indicators that may be relevant. At the same time, we must retain the possibility of being agile by aligning financial and human resources.

The aim is not to seek out all weak signals but to listen actively to signals that have meaning, impact in relation to the company's strategy and challenges

It is essential to prioritize the themes: we cannot be alert to everything and anything, but must rather make sense of things, while having this openness to the ecosystem in a global way. It is a key success factor, not allowing itself to be overwhelmed by masses of information on subjects that are not even related.

Technically, it is always possible to extend the monitoring scope, depending on the level of automation of the device. Only then can human intervention analyze and make sense of the raw information.

3. Avoid the bias of wishful thinking

Two kinds of wishful thinking may impede detection and interpretation of weak signals.

On the one hand, weak signals may be incorrectly decoded, and even completely neglected, because interpreters are concerned to reassure themselves about strategies that have already been put in place. Signals that might challenge existing assumptions can thus be called wrong, or considered invalid/irrelevant, because they have not been properly decoded.

Symmetrically, weak signals may be given undue weight because they would, if significant, support an existing strategy in which the interpreter is emotionally and institutionally overinvested.

One solution to this dual wishful thinking issue – neglecting what is clearly visible, imagining things that are not really there – could be to create compensation procedures, the deliberate creation of an opposite bias that ensures a balance between the wishful thinking group on the one hand and a form of methodological pessimism – a "devil's advocate function" – that organizations can call upon only if they have deliberately created it.

4. Adopt a transversal organization

The study of weak signals is a real work of collective intelligence. A limited, specialized group cannot be expected to have full interpretation, detection and impact analysis capabilities. It is essential to bring in all professional communities, whether experts or not, and to be able to identify and measure the impact behind them. It's real cross-cutting work.

The processes that are in place are self-emerging and when they are structured, one cannot give a single person the right to speak about specific issues. However competent, this person will have a unique prism and can tint (in good faith) the information returns and limit their ranges and openings.

This cross-sectional organization must:

- enable all employees to report information, without hierarchical categorization.
- allow weak signals to be discovered by cross-checking signals from different sectors
- integrate people with different levels of expertise on the subject, recognizing that non-expertise may also prove to be an asset.
- facilitate interpretation by integrating sectors with complementary viewpoints
- make operational implementation more effective by integrating the different sectors, particularly financial sectors, as early as possible.

5. Give continuity to the project

The study of weak signals must be truly long-term, and everyone must play the game, for collective intelligence requires that everyone be truly involved in the process, to the end and on a continuous basis. It is not a “one shot”: it is a tool to be introduced on a continuous basis. It is not known when or where the premises of the weak signals will **appear, so this is really a day-to-day job.**

Good strategic alignment between innovation and reality, between exploration and exploitation, is needed. It is important to have a corporate weak signals strategy to set a course and do things in greater depth. The study of weak signals is an investment in enabling companies to make the most of their ecosystems. This exploration requires patience and resilience.

6. Diversify the sensors used

Another key success factor is the diversification of methods for collecting information, as shown by the various examples mentioned above.

While **strategic monitoring** is the most obvious sensor to put in place, it is complementary to other sources. **Field feedback**, based on employees’ know-how and experiences, **creative sessions** to diversify decoding prisms, or an **analysis of social networks** that point to societal trends, are equally opportunities to explore.

7. Create internal awareness of the importance of the topic

The notion of a “weak signal” remains very abstract, so it is important to provide concrete examples in order to raise awareness, to understand the importance of the exercise and the approach, and to engage stakeholders in a collective intelligence approach that can work over time.

The value of the approach can be established retrospectively by looking at what had previously affected the organization. On a forward-looking basis, internal awareness can also be strengthened by effective monitoring, operating at two complementary levels, with metrics to track:

- relevance of the detected weak signals (e.g. institutionally validated detection),
- positive institutional outcomes of action based on validated detection - what difference made by the detected weak signals.

8. GOING FURTHER

- Share with peers, get feedbacks from other industries to improve our practices relying on collective intelligence
- Encourage discussion within the Club on how this white paper has proved useful to different organizations
- Proposal to create a cross-industry community to share practices and to create a heatmap to provide a better vision of the global ecosystem
- Proposal to add this topic in the 2021 agenda of the Club
- The working group remains open to any collaboration proposal on ad hoc topic

9. REFERENCES

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Websites

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- http://www.wedemain.fr – in French, website sharing “initiatives which will change the world”
- http://www.usbeketrica.com – in French, “media that explores the future”