Beyond Resilience: Outsmarting Randomness

I say unto you: a man must have chaos yet within him to be able to give birth to a dancing star: I say unto you: ye have chaos yet within you . . . —Friedrich Nietzsche - “Thus Spake Zarathustra”

Introduction

This paper contains the distilled essence of what I have learned during the last 15 years advising companies on a global scale, on the vital topic of developing and implementing business strategies in complex, uncertain and highly volatile environments.

In short, this is a story about why most companies have a Randomness disability -a critical fact in light of the massive Randomness present in the business environment- and how to overcome it.

A disclaimer: This paper does not follow a typical storytelling framework. I am using a logical framework inspired by Ludwig Wittgenstein, my most admired philosopher and the author of one of the most important philosophical works of all time, the Tractatus Logico-Philosophicus. (TLP).

I think it is worthwhile to provide a very short, albeit very relevant introduction on Wittgenstein’s views to put the paper in context.

The aim of the TLP is to show that the problems of philosophy can be solved by coming to a proper understanding of how language works. This is the dominating thought in all Wittgenstein’s philosophy.
Wittgenstein states that, to make sense, *language* needs to reflect the *world*\(^1\). He sees three levels of language from general to particular:

- Proposition
- Elementary proposition
- Names.

The corresponding three levels of the world are:

- Facts
- States of Affairs
- Objects.

Each level in the structure of the language matches a level of the structure of the world. Objects are denoted by names; names combine to form elementary propositions which correspond to state of affairs and each of these combine to form proposition or facts.

*Propositions picture facts.* Each level mirrors the corresponding one. The arrangement of names logically mirrors or pictures the arrangements of objects in states of affairs. It is in virtue of this picturing relation that the propositions compounded out of elementary propositions have sense. This is *the picture theory of meaning* which lies at the heart of the TLP, explaining how the world and language are connected and how meaning attaches to what we say when we use the language correctly.

This paper will make use of the three-pronged structure mentioned above, starting with the fundamental logical proposition, stating a crucial fact: *Organizations are Randomness Impaired;*

\(^1\) What is the world? Wittgenstein has defines it in the TLP: 1 The world is everything that is the case. 1.1 The world is the totality of facts, not things
then moving to elementary propositions - expressing states of affairs - that support the crucial fact and then moving to names and objects, which support the elementary propositions.

Most Organizations are Randomness Impaired.

This is the fundamental logical proposition in this paper. In my view, it pictures a fact in the world well-supported by plenty of evidence. We see almost every day in the business press news on companies struggling, and in some cases, collapsing as a result of random events, events beyond their control and beyond their (current) predictive abilities. This then logically and sensically represents a Fact in the world.

This fundamental proposition is supported by two elementary propositions:

- Randomness is growing exponentially
- Organizations have not being able to adapt to an increasingly randomized environment.

According to Wittgenstein’s framework, these two elementary propositions represent States of Affairs in the world right now.

Let us analyze those two propositions in more detail using a framework composed by Pieces of Evidence and Underlying Causes. In Wittgensteinian sense, Evidences and Underlying Causes are objects that can be named and directly observed.

Randomness is growing exponentially.

For anyone familiar with the business world there seems to be plenty of evidence related to this elementary proposition. I see two major clusters of evidences:

- Unexpected events are becoming commonplace
- Prediction success being almost inexistent.
Evidence 1: Unexpected events are becoming commonplace.

There are several recent and current events worth mentioning regarding this evidence.

One case in point is Donald Trump’s Presidential aspirations.

In June 16, 2015, Donald Trump announces that he will run for President.

During his speech, Trump called Mexican Immigrants “rapists,” leading many companies to cut ties with him. These comments have been followed by a series of attacks to other religious and minority groups.

In the second half of 2015, many influential political analysts in the US reacted by positing that this was sort of a reality show, that Trump never sought to be president but he only wanted to use the political arena to boost his businesses’ growth and profits. Many of them, like Carl Hiaasen, never saw any chance in his run. He wrote on July 12, 2015, in the Miami Herald: “Before one more straight-faced political story is written about the presidential candidacy of Donald Trump, the obvious begs to be stated: The man has absolutely no chance of winning.”

The point is that as of today, 2016-04-02, Trump is leading the Republican race by 10 solid points. He does have a real chance to the republican nomination and eventually to be President of the United States. This is Randomness in action.

Another relevant case is the dramatic fall of oil prices. Not even the top executives of the largest oil companies in the world anticipated the debacle of oil prices, maintaining their assumption that demand will continue to grow and supply would always need to catch up. The IMF World Economic Outlook of October, 2014 forecast that the "average price of oil will be $102 a barrel in 2014 and $99 a barrel in 2015."

Today, oil prices are around 38 dollars. In this descent to hell (at least for oil companies), Exxon Mobil’s market cap went from 450 b $ in July 2014 to 300 b $ in Feb 2016, a loss of a third in value.
Other cases of increasing randomness include how social media has transformed the world from much bigger people power to expanding jihadist attacks, China’s dramatic slowdown with the potential of a hard landing and Brazil’s political and economic meltdown.

As can be seen below, The Economist’s Intelligence Unit says that there might be more events around the corner that might deeply affect the geopolitical and business dynamics in the world.

**April 2016**

- 15 China experiences a hard landing
- 16 Russia's interventions in Ukraine and Syria precede a new "cold war"
- 16 Currency volatility culminates in an emerging markets corporate debt crisis
- 15 Beset by external and internal pressures, the EU begins to fracture
- 15 "Grexit" is followed by a euro zone break-up
- 12 Donald Trump wins the US presidential election
- 12 The rising threat of jihadi terrorism destabilises the global economy
- 8 The UK votes to leave the EU
- 8 Chinese expansionism prompts a clash of arms in the South China Sea
- 4 A collapse in investment in the oil sector prompts a future oil price shock

**Evidence 2: Effective Prediction is almost nonexistent.**

Randomness is defined as the lack of pattern or predictability in events.

The American philosopher Patrick Suppes in his 1984 book, Probabilistic Metaphysics, declares: “Phenomena that we cannot predict must be judged random.”
So it is clear that Randomness and lack of prediction are closely correlated in language and world.

I think we don’t need to cite examples of blatant failures of prediction in the recent years, from oil prices to economic growth. As the joke goes: "An economist is an expert who will know tomorrow why the things he predicted yesterday didn't happen today."

There is plenty of evidence, then, that predictions fail in predictably bad ways; this is, in a Wittgensteinian sense, a state of affairs.

I hope these two sets of evidence make it clear that the exponential increase of Randomness is definitely a state of affairs in the world we live in.

Counter Argument: It might be that randomness is not growing that fast, but rather that we lack understanding of the environment.

Before going to deal with the underlying cause, it is worthy to mention that some philosophers pose these questions:

- *Is randomness really random? Or are we being outsmarted by nature?*
- *“What is our reasoning for labeling things as “random”? Do we define things this way because we simply cannot understand them?”*

My point is that even if this argument is valid, the fundamentals of this paper still apply. One of the key aspects of the paper is the importance of developing a deep understanding of the business environment which will increase the level of understanding “things” -as it is mentioned in the questions above - or more precisely, understanding of states of affairs; this will in turn increase the chances of outsmarting Randomness.
Underlying cause: Increasing Complexity.

Our argument is that the reason why Randomness’ exponential growth is a state of affairs, is the increasing level of Complexity, which is now part of every system, being the world, a region, a country or an organization.

What is Complexity? Complexity is used to characterize something with many parts where those parts interact with each other in multiple ways. There is no absolute definition of what complexity means; the only consensus among researchers is that there is no agreement about the specific definition of complexity. However, a characterization of what is complex is possible.

In complex systems, it is harder to predict what will happen, perhaps because they interact in unexpected ways. It’s harder to make sense of things, because the degree of complexity may lie beyond our cognitive limits. And it’s harder to place bets, because the past behavior of a complex system may not predict its future behavior.

Complex systems have always existed, of course—and business life has always featured the unpredictable, the surprising, and the unexpected. There is evidence, however, that complexity levels have dramatically increased as a result of information technology, internet and social media revolutions.

Three properties determine the complexity of an environment. The first, Multiplicity, refers to the number of potentially interacting elements. The second, Interdependence, relates to how connected those elements are. The third, Diversity, has to do with the degree of their heterogeneity. The greater the multiplicity, interdependence, and diversity, the greater the complexity.

Non-Linearity, i.e., a characteristic of a system in which the output is not directly proportional to the input, is also a key attribute of complexity. Because enterprises are to an extent nonlinear and operate in a non-linear environment, leaders must identify, understand, and (to the extent possible) manage the key connections and dependencies that enable the enterprise to protect and create value.
This characterization makes the relationship between complexity and Randomness obvious and explains why we see complexity as the underlying cause of Randomness.

Now let’s move onto elaborate on our second elementary proposition.

Organizations have not being able to adapt to an increasingly randomized environment.

Again, there seems to be plenty of evidence for this elementary proposition. Business news brings everyday stories about companies that “didn’t see it coming” and as a consequence their results are seriously affected, in some cases jeopardizing the organization’s survival.

Evidence: They keep being surprised and seriously impacted by random events. “Why didn’t we see this coming?”

According to Fuld-Gilad-Herring Academy of Competitive Intelligence, in 2012 fully two-thirds of 140 corporate strategists polled admitted that their organizations had been surprised by as many as three high-impact events in the past five years.

Underlying reason: They have not developed the capabilities needed to cope with randomness

The aforementioned survey mentioned that the vast majority of companies surveyed —a staggering 87%— admitted that their companies have no early warning system in place.
Often the day to day struggle, short-termism and prevalent tunnel vision force the companies to deny or ignore what’s around the corner. Typically for many companies anticipation simply isn’t a top priority.

**Going Beyond Resilience.**

We want to state another fundamental proposition of this paper: *Organizations can catch up and even outsmart Randomness*.

How? By developing an intentional strategy aimed at moving Beyond Resilience.

**So what is Beyond Resilience?**

We have found a pictorial way to illustrate the concept of Beyond Resilience. It is based on two major components:

- Randomness mindset, which means the way organizations face Randomness. Based on our extensive experience on this area, we have seen three major ways people and organizations face Randomness:
  - Denial
  - Acknowledgement
  - Embracement.

- Locus of control, which refers to the extent to which individuals and organizations believe they can control events affecting them. There seems to be three levels of locus of control:

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2 In a world in which changes come from many different directions, the ability to balance organizational focus with the wide-angle view may be the most important ability for long-term survival and success. Our focal area can create blindspots
• External: We are at the hands of external forces with no control over them.

• Mixed: We have some influence on events

• Internal: Destiny is our hands.

Let us now picture a chart with Randomness mindset on the vertical axis and Locus of control on the horizontal axis.

This chart depicts four major states of affairs for organizations:

The first one, where the mindset is one of denial and the perceived locus of control is external, we call it Ruled by Randomness, the perception that we are totally at the mercy of luck. It is characterized by a feeling of Helplessness. The key tools or levers organizations have in this State of Affairs is Praying and Astrology -and we all know how well these work!
The Second one, characterized by Acknowledgement and an external Locus of Control, we call it Fragility.

Fragility is a state of affairs in which adversities in the business environment have a negative and meaningful impact on the ability to achieve their intended goals. It also might refer to more downside than upside coming from adversities.

Facts of the state of affairs:

- Centralization / Over-Intervention: Decisions taken at a “soviet supreme” level where people closest to the field have no say.
- Over leveraged with debt.
- Reliance on outside events.
- Over-Optimization - no redundancy or no room for mistakes.
- The mindset of relentlessly seeking to eliminate variability. Fragile people and systems seek to eliminate variability, noise, and tension.

The Key Lever organizations have in this State of Affairs is Prediction: The oft-referred Consensus View.

The third state of affairs depicted by the framework is one where there is Acknowledgement of Randomness and a Mixed Locus of Control. We name it Resilience, the ability to become strong, healthy, or successful again after something bad happens or, put it in a more physics-driven way, the ability of something to return to its original shape after it has been pulled, stretched, pressed, bent, etc.

Facts of the State of Affairs:

- Facing Reality head on. Resilient organizations have very sober and down-to-earth views of those parts of reality that matter for survival. That’s not to say that optimism doesn’t have its place: In turning around a demoralized sales force, for instance, conjuring a sense of possibility can be a very powerful tool. But for bigger challenges, a cool, almost
pessimistic, sense of reality is far more important. Facing reality, really facing it, is grueling work. Indeed, it can be unpleasant and often emotionally wrenching.

- Deep belief - Sense of mission - Meaning
- Uncanny ability to improvise: Inventiveness - Ingenuity
- Adaptability - Flexibility.

The Key Lever resilient organizations use is Sound Risk Management. The proper aims of risk management in business are to preserve existing value and to enable the creation of new value. Implicit in this view of risk management is the recognition of the reality that value and risk are inseparable.

What is the difference between sound and conventional risk management? Conventional risk management takes value preservation as its main purview and leaves risk taking for value creation (the reason that the enterprise exists) out of risk management. Change and turbulence, whether they originate within the organism or enterprise or in the environment, typically present the greatest threats and the richest opportunities—provided adaptation occurs. Adaptation may be gradual or sudden, effective or ineffective, but adaptation typically occurs in unexpected ways and in response to unanticipated changes and events.

The fourth state of affairs, and one that is central to this paper is Beyond Resilience, characterized by Randomness Embracement and Internal Locus of Control. To be truly effective in a world swirling with complexity, randomness, and risk, you can’t stop at resilience. Whenever you can, you should always find opportunities to actually grow from disorder, volatility, and adversity. In other words, benefiting from the dark side of Randomness.

Facts of the State of Affairs:

- Healthy Redundancy (aka Not over optimized). As opposed to mere redundancy - which can be costly and hence undesirable - a healthy redundancy is a low-cost "insurance policy" against volatility and randomness. Healthy redundancy refers here to resources
that are not necessarily being used at the current time (which can be perceived as inefficiencies with the wrong lenses on) but that the organization has access to when volatility hits, paying for their costs many times over. A good example of this is Warren Buffet’s cash position, getting a low return in peaceful times but creating huge value when crises come.

- Not highly leveraged with debt.

- Anticipation and Preparedness: It’s also essential that the organization maintain a constant state of vigilance. Vigilance and its corollary, situational awareness, is the characteristic of being aware of the environment and changes in it, and of what the organization can do to respond effectively. It’s harder than it sounds, and many enterprises fail to choose promontories from which to scan the horizon, fail to develop devices with which to detect changes, and fail to employ early-warning systems regarding threats and opportunities.

- Agility: network mindset. It is of no use to have the conditions mentioned above if an agile response from the organization is absent. Agility is driven by decentralization, minimum bureaucracy and intervention from central commands and also by a keen sense of anticipation and timeliness. It can be put in simple terms: the guts and timeliness of buy low and sell high. Agility also includes the capacity to operate as a loose network as opposed to a very rigid hierarchy. An agile enterprise can often avoid negative impact (e.g., by anticipating a competitor’s move or a technology that could supersede its own) or take advantage of opportunities for growth (e.g., by moving from a centralized to a decentralized structure, acquiring another company, or changing its business model). The more decentralized the approach, and the more middle managers and employees are able to make decisions and act, the nimbler the organization will become.

Key levers:
- **Optionality**: The extent up to which the organization's assets (both tangible and intangible) provide fast access to other courses of action when uncertainty and volatility hit. Options include for instance, "embedded options" in contracts and an “eject button” - an exit strategy - to push when the situation so deserves.

- **Indispensability**: The state in which the organization has the unique ability to address a critical, burning need of key stakeholders. It helps the organization position itself as a trusted advisor to them.

**Becoming a Beyond-Resilience Enterprise: BRE.**

We believe in the fundamental proposition central to this paper: Organizations can catch up with and even outsmart Randomness.

Let’s start this chapter with another key pictorial representation we have been using for many years: that of the strategic temple.
As you can see from the picture, there are three major components in an strategic temple:

- The Roof, which characterizes the ultimate metric of success, in this case becoming a Beyond Resilience Enterprise, and the key levers - already defined - to achieve that result: Optionality and Indispensability.
- The Pillars, key strategic areas that need to be developed at a world-class level to ensure the achievement of the ultimate result. In this case we have four pillars:
  - Discernment
  - Anticipation
  - Preparedness
  - Decisiveness
- The Foundation, which represents the key enablers to execute the strategy at the pillar level. In this case we have two sets of foundational elements:
  - A first layer of visible capabilities: Abilities and Processes. According to our experience, the 5 most important ones at this level are:
    - Peripheral vision
    - Probabilistic Thinking
    - Business Intelligence
    - Analytics
    - Making Anticipation a Priority
  - A second, underlying layer of Resources:
    - Talent
    - Organizational Roles
    - Relationships (mostly external ones)
    - Technology

We will now explore and explain in more detail each of the elements comprising the BRE strategic framework.

The Roof: Optionality and Indispensability

Optionality gives you the right, not the obligation, to decide and act when a particular external trigger is activated. Indispensability is achieved when you provide a unique solution to key stakeholder’s burning issues. They will be dealt with in more detail in the next version of this paper.
The Pillars: Discernment, Anticipation, Preparedness and Decisiveness.

Pillar 1: Discernment

Discernment is the ability to obtain sharp perceptions or to judge well. It is interesting to define perception here as a concept. Perception (from the Latin perceptio, percipio) is the organization, identification, and interpretation of sensory information in order to represent and understand the environment.

We see three major components of Discernment as described below.

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3 Another way to define Discernment: is the ability to distinguish between the real and the unreal, to quote advaita vedanta philosophy.
**Uncertainty Territories (UT):**

The first one is the capacity to identify the Uncertainty Territories, those areas within the business environment that represent the major sources of volatility and randomness for the industry in general and the organization in particular. Inspirit has developed a process to identify the uncertainty territories which is described in detail in a separate paper. Therefore, we will not address this issue in detail in the present document. Suffice to say as examples that areas like macro-economy, political, social, technology and regulatory are typically sources of Randomness. Inspirit’s process take the uncertainty territories as a starting point and develop potential end-states as *correlated combinations* of those territories within the planning time horizon of the corporation; this analysis is followed by a Pathway investigation, whereby potential paths from current to the defined end-states are explored and described. By completing this exercise, organizations develop a clear view of:

- Key uncertainty areas and their systemic relationship among them
- A whole spectrum of potential futures in the business environment
- What it does need to happen to get from where we are to each end-state.

**Deep Learning:**

Once the uncertainty territories have been identified in detail, an in-depth study and learning of them needs to happen. Our experience shows that an effective way to accomplish this is by creating the roles of UT champions, whereby a person is given the responsibility to deeply immerse and investigate the past, present and potential futures and each UT. This has to be an intentional and directed process - as opposed to random and occasional reading and following news - in order for it to be of value.
Pattern Formation.

Same UT champions are also in charge of “connecting the dots”, i.e., develop the patterns within each territory and among them. This is best done through a systemic analysis, which creates a pictorial view of patterns.

The key deliverable of the pattern formation component are the Triggers or early warning signals that can herald changes in the business environment.

Pillar 2: Anticipation

UT champions pass the baton to the Anticipation “Unit”, typically a small team fully dedicated to ensuring that the organization is able to see what’s coming and therefore minimizing the levels and depths of surprises generated by random events.

The major components of Anticipation are described below.

Environmental Scanning:

Perception and Identification of the Potential Early Warning Signals deriving from certain objects, states of affairs (events) and trends in the UT defined before, associated specifically to the triggers identified through discernment.

One key aspect of the environmental scanning process is gathering relevant data from reliable sources.

Sources can include:

- Websites and search engines
- Social Media
- Feedback from people on the field, suppliers, distributors
- Customer surveys
- Contracted research services
- Personal contacts.
Once sources have been identified, the scanning consists in regularly collect and organize the information, in a disciplined manner.

**Filtering**

Obviously not all that is scanned is useful. We need to separate the wheat from the chaff or the signal from the noise. This is the main role of this component.

In signal processing, a filter is a device or process that removes from a signal some unwanted component or feature. Filtering is a class of signal processing, the defining feature of filters being the complete or partial suppression of some aspect of the signal.

In the business arena, some perceived events like dramatic variations of commodity prices over a short period of time are noise hiding most profound causes that are the real signal.

**Sense-Making**

Sense-making is the process by which people give meaning to experience.

Sense-making is an active two-way process of fitting data into a frame (mental model) and fitting a frame around the data. Neither data nor frame comes first; data evoke frames and frames select and connect data. When there is no adequate fit, the data may be reconsidered, or an existing frame may be revised.

What is the key deliverable of this pillar? It is Meaning understood here as a limited number of key propositions or hypotheses about meaningful, potential states of affairs of the future that can become Facts. Once they become Facts is too late to act and the organization will be caught by surprise.

**Pillar 3: Preparedness**

The Anticipation team is typically in charge of this pillar. Its main outcome is a call to action.

Two major components are included in this pillar:
War gaming and Contingency Planning.

War gaming

War gaming is a simulation process whereby an organization team recreates events as they unfold in a particular trajectory and explore their options and potential decisions they would make if the future evolves that way. The BeyondResilience Pathways methodology is quite helpful in executing this process. The Pathways process consists of visualizing the path from the current reality to a particular end-state and asking ourselves what external events need to happen in order for that particular end state to materialize in a determined period of time. In addition, assuming a perfect foresight, the process asks what decisions you would make if you clearly see that future evolving.

Contingency Planning.

A contingency plan is a plan devised for an outcome other than in the usual (expected) plan. It is derived from war gaming and pathways analyses as a way to deal with unexpected though previous considered events that are not part of the mainstream plan.

The activation of contingency plans depends upon a smart environmental scanning and the existence of triggers that activate them.

Pillar 4: Decisiveness

Organizations may have developed their discernment, anticipation and preparedness skills to the highest level but if they do not timely act when it is required, the Beyond Resilience state of affairs will not be achieved. In this sense, Decisiveness is key to ensure Beyond Resilience. The CEO and Executive Team, supported by the Board, are typically the owners of this pillar.
Agility.

As said before, Agility is the ability—the coordination, speed, and strength—to change position quickly to avoid or mitigate the effect of an impact, to roll with the punches. Agility is also the ability to move quickly, even to assume a new configuration, to achieve a desired outcome. An agile enterprise can often avoid negative impact or take advantage of opportunities for growth. The more decentralized the approach, and the more middle managers and employees are able to make decisions and take action, the nimbler the organization will become.

Courageous Behavior.

Involves the resoluteness and determination to exercise options and activate contingency plans in a timely manner. It is one of the hardest to execute components in the Beyond Resilience strategy framework. We have seen many organizations good at anticipating and even getting prepared for random events, but they fail at this phase. The jury is still out to determine the reasons why this behavior is so hard, but fear of failure, status quo bias and the “don’t rock the boat” mentality are potential candidates.

The Foundations

As mentioned above, the foundations have two layers: Abilities and Processes and Resources. A brief description of each component follows.

The first layer: Abilities and Processes.

Peripheral vision

The periphery might be defined as “wherever attention is not”. Attention is always selective, and this selectivity is necessary for achieving focus and clarity of vision, in turn aiding the exploitation of an organization’s limited resources. Concentrating attention and energies on selected areas enables the development of a specialized expertise that contributes to the competitive advantage
of a business corporation within a specific industry. Yet this process inevitably creates blind spots that prevent it from identifying threats or exploring new market opportunities that may exist in the creative intersections between industries.

Peripheral vision and awareness involve a cultivated sensitivity to the marginal, the hidden, the obscured and to what lies outside the frame of conscious attention. It involves instilling an appreciation of the critical importance of the more mundane, unspectacular and less visible aspects of the changes occurring within an organization’s operating environment. It also draws attention to how such almost imperceptible changes can sometimes generate dramatic longer-term “butterfly effects”.

Peripheral scanning is important because:

- Danger often comes from the periphery rather than from the center
- It questions the organization’s assumptions
- It counters well-established routines that might lead to ignore early warning signals of something coming
- It facilitates the discovery of new opportunities
- It stimulates exploration
- It takes the organization out of the comfort zone.

Tactical and operational nature on most organizations forces executives to a tunnel vision. Peripheral vision is definitely a core competence for adaptive organizations, contributing to making meaning out of apparent noise.
Probabilistic Thinking

We live in a culture obsessed with predictability. People are so used to think in terms of black and white: yes/no, possible / impossible. People need to acquire the habit of thinking in probabilities, as opposed to the deeply ingrained habit of deterministic thinking. The problem is that it's excruciatingly difficult in real life because our brains aren't wired that way.

We have found in our experience that three habits are essential to overcome this disability:

• Always think in diverse futures; in other words, do not view the future as singular.
• Avoid prediction at all costs.
• Establish a language protocol when talking about the future: never say: this will never happen; that is impossible. I am sure of this, and so on. Instead welcome any counter-intuitive idea of what might happen - no matter how bizarre it looks - analyze and explore potential actions you would execute if that event happens.

Business Intelligence

Business intelligence (BI) can be described as a set of techniques and tools for the acquisition and transformation of raw data into meaningful and useful information for business analysis purposes. BI technologies are capable of handling large amounts of unstructured data to help identify, develop and otherwise create new strategic business opportunities. The goal of BI is to allow for the easy interpretation of these large volumes of data. Identifying new opportunities and implementing an effective strategy based on insights can provide businesses with a competitive market advantage and long-term stability.

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4 Probabilistic thinking was a mid-17th century artifact originating in a famous correspondence between Fermat and Pascal -- a correspondence on which Huygens based a widely read textbook: On Calculating in Games of Luck (1657). The probabilistic framework didn't exist until those people cobbled it together. It remains in use today, much as in Huygens's book.
Analytics

Analytics is the discovery, interpretation, and communication of meaningful patterns in data. Especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming and operations research to quantify performance. Analytics often favors data visualization to communicate insight.

Analytics is multidisciplinary. There is extensive use of mathematics and statistics, the use of descriptive techniques and predictive models to gain valuable knowledge from data analysis.

Making Anticipation a Priority

Implementing this complex framework requires full commitment of the CEO and the top management team to make Anticipation and all its related competencies and processes a Big Priority in the organization. Incorporating the Anticipation protocol in business reviews, conversations, executive committees and continually challenging assumptions, etc. is a fundamental condition for this framework to be implemented successfully.

The second layer: Resources

The second layer of the foundations can be compared to a substratum on which everything else mentioned here can adhere.

Talent

Not much need to be said here. Having the right talent with the aforementioned competencies is of the essence. It must be integral part of the talent management process in the organization to select, develop and reward the right anticipatory framework.

Organizational Roles

Clear accountability on the Beyond-Resilience framework is another crucial success factor.
- At the top-most executive level, there should be at least a Quarterly Review, insights generation and corporate strategy refinements based on triggers, flags and call to action generated by the BR process.
- The COO and Business Leaders should ensure that businesses implement the protocol described in the temple above (Discernment, Anticipation, Preparedness and Courageous Behavior) on a regular basis as a lever to the Beyond-Resilience state of affairs.
- Uncertainty Territory champion: We have found this one to be a critical success factor. This role will:
  - Ensure that the organization has the most up-to-date intelligence in the particular territory
  - Provide a periodic review of metrics and integrate them into the associated triggers.
  - Produce a quarterly concise document on emerging trends of UT.
- CFO and Risk Management: Ensure that the BR is part of the DNA of the risk reviews.

Relationships (mostly external ones)

External relationships, including key stakeholders like regulators, government officials, suppliers, customers, etc. are an incredible source of signals and insights. Organizations must have in place a protocol - A Customer Relationship Management type of process - to intentionally capture, process, disseminate and analyze those signals and incorporate them into the Anticipation framework.

Technology.

Technology is a foundational enabler to achieve desired results. From right hardware platform to analytics software tools.