MASTER

Master in Management Information Systems

MASTER´S FINAL WORK

DISSERTATION

TREND TRACKING APPROACHES: A CRITICAL OVERVIEW AND POSSIBLE INTEGRATION BETWEEN INTERNAL AND EXTERNAL ENVIRONMENT

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"The secret is here in the present. If you pay attention to the present, you can improve upon it. And, if you improve on the present, what comes later will also be better" - Paulo Coelho.

LIST OF ABBREVIATIONS

CRM – Customer Relationship Management.

OCR – Optical Character Recognition

RPA – Robotic Process Automation

STEEP - Social, Technological, Economical, Environmental and Politic

TAL – Trend-Awareness Layer

VoIP – Voice over Internet Protocol

VUCA – Volatility, Uncertainty, Complexity and Ambiguity.

NOTE

Organization in this thesis refers to the company, corporation, organization or any other designation for a group of people who work together in a structured way for a shared purpose, no manner its dimension, profitability, or physicality; and which is conducting trend searching activities.

ABSTRACT, KEYWORDS AND JEL CODES

This thesis discusses the relation between the trends, the organization's internal environment and how to prepare for the future that lies ahead. It presents the most accepted definitions of foresight area, proposes a theoretical framework based on VUCA, STEEP and its application in a real organization of the banking sector. The objective is to help organizations understand their environment and better align the actions to an uncertain future.

RESUMO

Esta dissertação discute a relação entre as tendências, o ambiente interno da organização e como se preparar para o futuro que está por vir. Ela apresenta as definições mais aceites da área de *foresight*, propõe um esquema teórico baseado no VUCA, STEEP e sua aplicação em uma organização real do setor da banca. O objetivo é ajudar as organizações a perceber seu ambiente e alinhar da melhor forma as ações para um futuro incerto.

KEYWORDS: Foresight; Competitive Intelligence; Strategic planning.

JEL CODES: M16; M20;O31.

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1. INTRODUCTION

With the world in constant change and the large amount of information available, strategic decision making and managerial action is becoming complex (Mühlroth and Grottke, 2018). Companies need to face an environment that is subject to constant change that could become threats or opportunities of growth (Ansoff, 1975). Although it is not possible to predict the future, given enough warning, the company should be able to avert the threat or seize the opportunity.

In this world, discontinuities and surprises will occur with increasing frequency concerning leaders to gain more insights and understanding regarding trends and future issues (Ansoff, 1975; Saritas and Smith, 2011). All organizations face the challenge of adapting their environment with the outcome of either failure or success (Aldrich, 2008). Hence, the organizations need to be aware of their environment, prepared to face uncertainties and know how to use the information to sense the emerging future (S Day and Schoemaker, 2005).

However, the problem of interpreting the signals when perceived and integrate the foresight process into the organization's strategy still persists. Also, there is the need for a better analysis regarding the connection between information gathering and taking future oriented actions (Reger, 2001; van der Steen *et al.*, 2011). How to cope with an always mutating environment and take action to prepare for the shaping future?

The present dissertation aims at proposing a framework to combine the external trends with the internal environment found in the organization, in order to create a better strategic planning by increasing its added value towards an uncertain future.

The dissertation first presents a literature review of the most accepted definitions of the foresight environment. The conclusion section will discuss the benefits of the use of proposed framework and indicate possible future studies regarding the subject.

The research paradigm follows a social constructivism approach through the interpretative framework, where the particular meanings of the Trend Tracking framework proposed were developed based on individual understanding and experience, as defined by Creswell (2013).

The application of the proposed framework is also based on research participants answers to open-ended questions as suggested as well by Creswell (2013).

2. LITERATURE REVIEW

2.1. *Foresight and Environmental Scanning*

The concept of foresight in the French perception 'la prospective' is built on three assumptions. First one is that multiple futures are possible. Second, states that change (drivers) can be identified and studied. Finally, the third one is that the future can be influenced (Berger *et al.*, 2008).

Rohrbeck et al. (2015) presents an interesting historical background of the foresight research area, from its birth in the 1950s with the appearance of French 'la perspective' school of Gaston Berger and the US-based 'foresight' school grounded in the works of Herman Kahn, to organization integration from 2000 and beyond where there is a need for integration of foresight in the organization's processes.

Different definitions have been used to relate foresight and decision making in an organization. Ahuja et al. (2005) defines foresight as a personal ability. They define *managerial foresight* as the ability to predict how managers' actions can create a competitive advantage. Slaughter (1997) defines *strategic foresight* as an organizational ability focused in using the insights gathered to prepare for the future.

Rohrbeck et al. (2015) defines *corporate foresight* as practice that enables an organization to lay the foundation for future competitive advantage by identifying, observing and interpreting factors to achieve value creation. This thesis uses that definition.

In order to initiate the exercise of corporate foresight, the starting point is usually the identification of key trends. There are a variety of definitions for trends, Cambridge dictionary defines trend as the general direction of changes or developments (Cambridge, 2008). Although this definition does not encompass the full meaning of trends, it shows the common sense of a force that drives the trend towards a direction. (Saritas and Smith, 2011) defines trends as "change factors that arise from broadly generalizable change and

innovation". In this case, the trends are not only experienced in a single environment but affects everyone and everywhere.

As an example, the following topics such as aging of population (Kuosa, 2010), the pursue of digitalization and automatization (Wisskirchen, 2017) and electric mobility (Dijk, Orsato and Kemp, 2013) can be considered as trends.

Trends "create broad parameters for shifts in attitudes, policies and business focus" (Saritas and Smith, 2011) in a long-term process with a global reach and acceptance and they are usually demarcated by its macro environment.

In addition, trends can be analysed according to their duration, scale, evolutionary pathways and structure. They also consist of a projection into the future that is characterized by visions, personal opinions, suppositions, wishes and pure speculation (Pillkahn, 2008).

This work considers the STEEP (Social, Technological, Economical, Environmental, Politic) analysis, to classify the trends as proposed by Pillkhan (2008) with minor modifications to accommodate the purpose of this paper, as shown in the Table 1.

TABLE 1: TREND CLASSIFICATION ACCORDING SUBJECT AREA

Acronym	Area	Type
S	Society	Societal trends
T	Technology	Technological trends
E	Economy	Economic trends
E	Ecology	Environmental trends
P	Politics	Political trends

The first signs of new trends can be found mainly in societal groups that are exposed to the conflicts between our notion of traditional values and societal realities that could jeopardize an organization's strategy, for example, the aging of society (Pillkhan, 2008; Kuosa, 2010).

In addition, there are essentially a matter of new technologies that could generate new consumer needs or replace existing technologies. The evaluation of several competing technologies is significant in this connection. An example is the 3D printer technology

that allows NASA to send blueprints of tools to ISS (International Space Station) by email instead of sending the actual tool using a cargo rocket.

In the economic area, the trends essentially arise via changes in types of business processes and value-creation chains (Pillkhan, 2008). For example, blockchain and the advent of cryptocurrency exchange markets. The organization should be prepared for scanning, interpreting, and building new business models (Rohrbeck and Kum, 2018).

In the ecology area, trends encompass changes in nature and the environment, for example, global warming and climate change (Pillkhan,2008; Saritas and Burmaoglu, 2015). Completing the categorization, political decisions and elections have an impact on lawmaking and lead to extensive changes, (Pillkhan, 2008) for example, the advent of refugee and migrant crisis after 2015 (Carastathis, Spathopoulou and Tsilimpounidi, 2018).

Drivers are the forces that cause a trend to move and sustain it (Gordon, 2010), a critical concept associated with being a driver is the level of uncertainty (Saritas and Smith, 2011) meaning that they can affect the future in several different ways. In this context, drivers of change can be defined as the factors, forces or events that are presently accessible and future relevant (Kuosa, 2010).

They are different from the concept of trends. Instead of being mid-longer term and relatively pervasive, drivers are area-related, involve factors and forces that change every year and may influence the stakeholders' actions and strategic choices (Saritas and Smith, 2011).
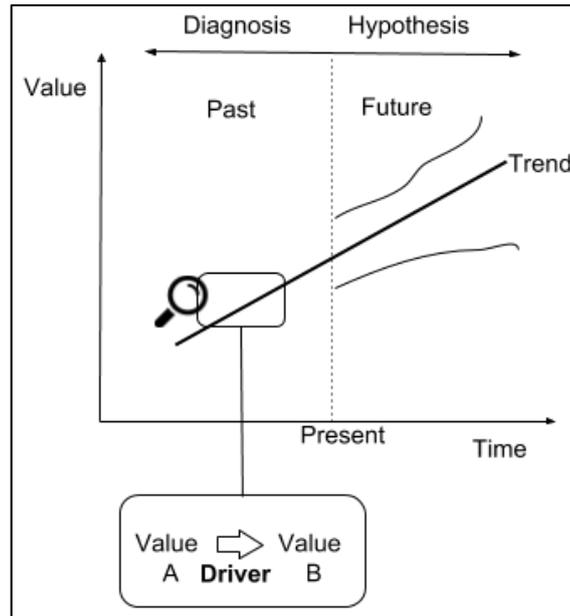
Figure 1: Drivers of change effect across time and value (adapted from Pillkhan, 2008)

Figure 1 shows the effect of drivers in a trend across time. Drivers and forces can be identified for each change that is manifested in the form of a trend and that can be represented using a reference or benchmark. Trends can thus be seen as being carried by drivers and forces. These determine the direction and strength of trends. Counter forces also exist (or emerge in the course of trend development) that have the effect of weakening or even blocking trends (Pillkhan, 2008).

Discontinuities are those situations that occurs over time and extending beyond single events, change is rapid and fundamentally alters the previous pathways or expected direction of reality (Saritas and Smith, 2011). While this is normal in most market places where the processes of creative destruction and products and services innovation are familiar, when discontinuities occur in society and government, the changes tend to be more significant because they can alter so many other domains (Saritas and Smith, 2011).

Saritas and Smith (2011) offer an example of how Google, Wiki, VoIP, Facebook, YouTube and similar innovations like WhatsApp, Twitch and Instagram create powerful forces that change the business and social environments, affecting the way people interact with information.

Other recent example, also in the form of technological discontinuities, is the possibility to download a 3D blueprint of a gun and print the weapon using a 3-D printer, without experience and difficulty. This is huge a discontinuity in the area of security.

Ansoff (1975) proposed five states of knowledge when dealing with discontinuity: Sense of threat/opportunity, Source of threat/opportunity, Threat/Opportunity Concrete, Response Concrete and Outcome Concrete. The latest being the highest state of knowledge where all the information required for strategic planning is known.

On the other hand, the first level is the highest level of ignorance where the only knowledge is that some threats and opportunities will undoubtedly arise, but their shape, source and nature are unknown.

Although the concept of weak signal is widely used in the business literature an exact definition is not easily found (Mendonça *et al.*, 2004). This thesis considers weak signals as being the early signs of possible but not confirmed changes. They may later become more significant indicators of critical forces for development, threats, business and technical innovation. Weak signals represent the first signs of paradigm shifts, or future trends, drivers, or discontinuities (Saritas and Smith, 2011).
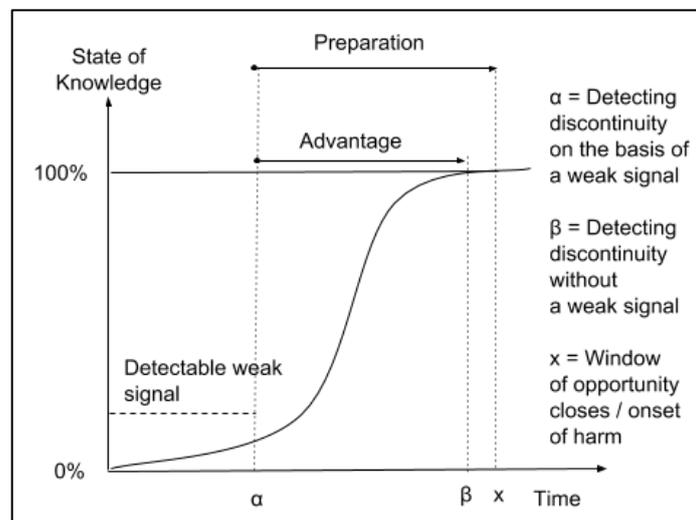

Figure 2: Weak signal evolution across time and knowledge level, adapted from Pillkan (2008).

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Probably the best work in presenting the concept and importance of weak signals has been presented by Igor Ansoff (1975). He discussed that "if management is receptive to weak signals, much can be done long before the threat becomes tangible". When detecting weak signals at an early stage, as shown in Figure 2, good opportunities are generated with crucial competitive advantages (Pillkan, 2008).

Saritas and Smith (2011) offer the following examples of weak signals: the first mention made in the 80's about the warming and climate change and the fact that the growing importance of nanotechnology was first apparent as early as 1986 when Eric Drexler issued his first book on the subject (Drexler, 1986).

As weak signal detection aims at identifying discontinuities as early as possible, a data approach should be considered when analysing the data. According to the literature review performed by Mühlroth and Grottke (2018) on weak signals, despite the idea that a weak signal scanning system should process as much as data as possible to detect the minimal changes in it, this approach was found to be ineffective due to a lot of noise being introduced by irrelevant data. Therefore, the solution used by researchers was to limit the data coverage.

We tend to look to the past and project into the future. Trend-extrapolation or trend-projection is the most used method in forecast (Kuosa, 2010). As strongly highlighted by Kuosa (2010) and Gordon (2010) trend searching as a extrapolation of the historical and current time-series path directly into the future assuming that the future is going to be a logical and direct extension of the past, usually fails.

Even though Kuosa (2010) notes that it is a useful approach to highlight one particular section of the transformation, both authors agree that this approach ignores the non-linear and overlapping factors of transformation and is therefore inefficient in establishing a solid foresight containing all issues.

Environmental scanning describes a process where operational environment of an organization is systematically scanned for relevant information (Kuosa, 2010). The purpose is to identify the early signals of environmental change and to detect environmental change already underway (Schwarz, 2006).

Environmental scanning can be divided in two approaches. The outside-in approach tries to scan the entire operational landscape (outside world) in order to avoid blind spots.

Still, this approach is affected by the problem of information overflow. The other approach of environmental scanning is inside-out, which limits the number of fields of interest and the amount of information gathered. However, carries the danger of enhancing blind spots by limiting the focus of the organization (Schwarz, 2006).

Usually, the 'inside-out' approach will predominate because time and financial resources are limited and an 'information overload', as discussed above, is very fast reached due to the huge quantity of variables to consider (Reger, 2001).

2.2. Competitive Intelligence and Business Intelligence

There are several definitions of Competitive Intelligence (CI) but not a universally accepted one (Pellissier and Nenzhelele, 2013). According to Pellissier & Nenzhelele (2013) a possible universal definition of competitive intelligence is: "A process or practice that produces and disseminates actionable intelligence by planning, ethically and legally collecting, processing and analyzing information from and about the internal and external or competitive environment in order to help decision-makers in decision-making and to provide a competitive advantage to the enterprise."

Although this former definition does a good job in uniting all point of views regarding competitive intelligence, this thesis believes the following definition proposed by Correia (2010) to be the most relevant to its context: "The conversion of data and information, gathered by an organization from its external and internal environment, into intelligence that supports the organizational decision-making process".

Over the past 20 years, the use of competitive intelligence by strategic management has increased mainly due to the need of the enterprises to scan the complex external environment (du Toit, 2015).

In 1998, Jonathan Calof presented competitive intelligence as a process with the following steps: (1) obtaining competitive intelligence requests; (2) collecting information; (3) analyzing and synthesizing information; (4) communicating intelligence; (5) and managing the competitive intelligence process (Calof, 1998). According to João (2015) the four stage of intelligence cycle is more than enough to generate intelligence.
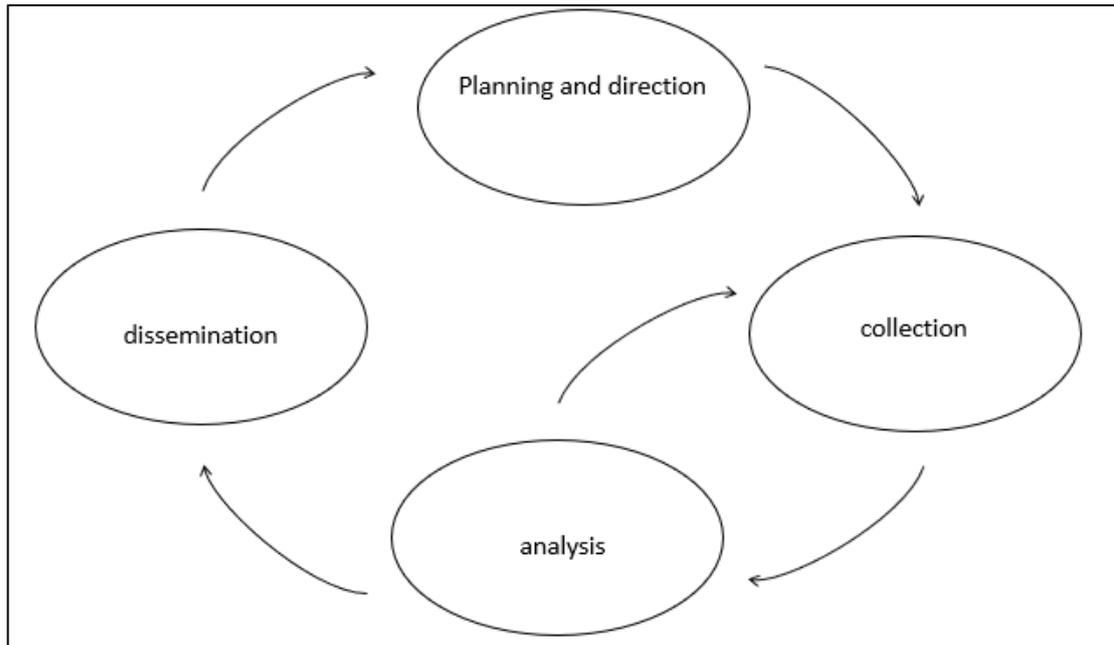
Figure 3: The Intelligence Cycle, Adapted from João (2015)

Planning and direction is the first step and it is focused in planning the collection of information according to key intelligence needs. The second one, collection, consists in the gathering of information from a variety of sources. The analysis is where specialized skills and competences are required.

The goal is to not only focus on the marketplace but also on everything that could impact where the organization operates, the analyst may find necessary to go back one step and collect more information before continuing (Taborda and Ferreira, 2002). The last part is the dissemination, in this step, occurs the organization of information and communication to management. The report delivered should contain actionable intelligence resulted on the previous analysis in order to help managers on the decision-making (Taborda and Ferreira, 2002).

According to Rolande et al. (1990), business intelligence (BI) can be understood as the establishment of formalized and organized information system aimed to collect, analyze, and disseminate information related to the business environment, in a continuous and dynamic manner. Business intelligence also includes knowledge management, which is focused in producing new knowledge through the sharing of internal expertise (Nonaka, 1995).

Sometimes, BI and CI are used as equivalent in the literature with the only difference being the region where it is used, in USA the term competitive intelligence is more used than business intelligence in France (Tarek and Adel, 2016). However, Pascal (2002) establishes a clear distinction revealing that business intelligence is a response to an information need while competitive intelligence is a response to a need for the decision making. Therefore, competitive intelligence is a broader area, that uses the results of business intelligence to create knowledge.

2.3. VUCA

The concept of Volatility, Uncertainty, Complexity and Ambiguity (VUCA), was first developed by the U.S. military after the Cold War to define conditions which, military leaders encounter on the battlefield (Codreanu, 2016; Millar, Groth and Mahon, 2018).

Nowadays, the concept has come to define the competitive environment of the digital economy in which organizations must adapt past structures to match environmental change (Cousins, 2018). The interesting characteristic of VUCA is the simultaneous focus on each attribute and their interaction (Millar, Groth and Mahon, 2018).

Volatility refers to relative unstable change that is available and sometimes unpredictable (Bennett and Lemoine, 2014). Volatility captures sudden, extreme and multi-layered fluctuations in different aspects of society and indicates the difficulty of identifying and describing these changes in a pattern like manner as it used to be the case in a stable world (Codreanu, 2016).

Uncertainty points out to a lack of knowledge to understand whether an event will have meaningful ramifications and if will create a significant change in the environment (Bennett & Lemoine, 2014). It also can be defined as characteristic of a situation in which the problem solver knows the structure of the problem but does not have knowledge about its variables (Millar, Groth and Mahon, 2018). Environmental uncertainty can be explained as the level of increase in environmental dynamism and complexity (Ivančić *et al.*, 2017).

Since there is a ineffectiveness tentative to read the present through the lenses of past, it becomes clear the uncertainty of the future (Codreanu, 2016). Because uncertainty

exists in the absence of proper information regarding the subject, addressing it requires obtaining information (Bennett and Lemoine, 2014).

Complexity points out to the need of processing a great deal of information related to the complex situation. Collect, digest and understand the information is key to take advantage of environmental complexity rather than struggle against (Bennett and Lemoine, 2014).

Lastly, Ambiguity is the result of all the above features where the inability to provide a "yes or no" solutions occurs (Codreanu, 2016). Since the nature of cause-effect relationships is not to clear, the solution to ambiguity relies in experimentation (Bennett and Lemoine, 2014).

3. THEORETICAL FRAMEWORK

3.1. Internal and external environment

Organizations recognize that they need to get better at going beyond their border to gain greater clarity into the always mutating world and increasingly dubious future. According to Gartner, more than 35% of the top 5,000 global companies will regularly fail to make insightful decisions about significant changes in their business and markets (Gartner, 2009) . This reveals the importance of an environment-driven approach to avoid being surprised by changes and uncertainty.

Regarding the concept of 'environment', the literature usually applies the distinction between the "general" and the "task environment". The latter is related to the elements that the organizations have a direct contact such as competitors, regulatory bodies, suppliers and customers (Dill, 1958; Ammentorp, 1968). The theory of task environment was later incremented with Porter's view of the Five Forces that shapes the organization (suppliers, customers, competitors, potential incomers and substitute products) (Porter, 1980) introducing the concept of micro environment.

On the other hand, the general environment refers to factors that indirectly affect the organization; the STEEP factors, discussed in the literature review, affects the business micro environment, and which are today commonly referred to as the business macro-environment (Fahey, 1998). To simplify the understanding, this thesis considers

micro-environment as internal environment and macro-environment as external environment.

TABLE 2:RELATION BETWEEN TOOLS AND OUTPUT BY ENVIRONMENT (ADAPTED FROM PILLKAHN, 2008)

Level	Tools	Output
Internal environment	Organization, internal culture, business structures, workshops, etc.	new products ideas, new business opportunities, cultural arrangement.
External environment	Society, economy, political, system, religion, science, etc.	laws alignment, innovation, social awareness

In this classification, the environment is divided in two levels (Table 2), internal environment and external environment, both will dictate the future path of the organization.

The external environment has the capability of triggering events that create uncertainty about the future of the organizations (Peter and Jarratt, 2015) . In order to better classify the aforementioned force, this thesis proposes a new concept called 'Direct Hit'.

Direct hit is the 'shock' received from the external environment of new signs that could endanger the organization's integrity and strategy. Given that in the external environment the company does not control the engines and actions that shape the immediate surroundings, the direct hit will be the force of the external environment applied in the direction of the internal environment.

The internal environment is known to be an environment where the managers can influence (Kuratko, Hornsby and Covin, 2014). In this context, this thesis extends the concept and proposes a new understanding for 'Direct Reach', a perceived influence applied by the organization inside its boundaries. Therefore, by making use of the 'direct reach', organizations can actively dictate the structure of its internal environment. This is a force of inward direction.

Nevertheless, it is important to remember that in some cases, such as a creation of a new market niche as seen in Apple with the iPhone series (Forbes, 2014), the organization can also apply a direct reach acting as an influencer in the direction of the external environment.
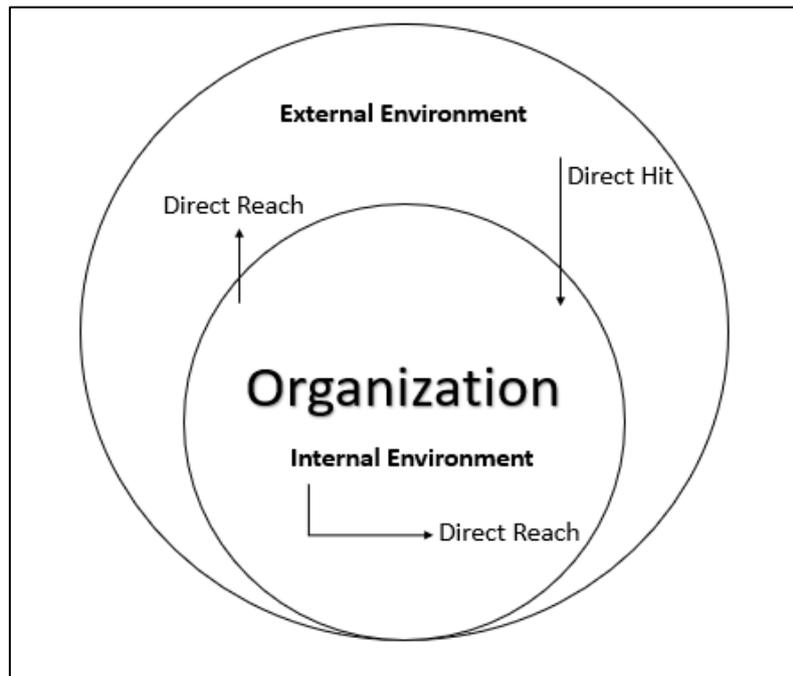
Figure 4: Visual representation of Direct Hit and Direct Reach

Companies are inserted in an environment that is rich in information. From 2005 to 2020, the digital universe has grown by a factor of 300, from 130 exabytes to 40,000 exabytes. Until 2020, the digital universe is expected to double every two years (Gantz, Reinsel and Shadows, 2012).

Consequently, organizations can never deal completely with the complexity of the real world (Pillkahn, 2008). The external environment of the organization is a major source of uncertainty for the decision makers that are responsible for detecting the opportunities and threats and for providing an answer timely (Capon and Shrivastava, 1996).

In this context, "there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't

know". This quote from Donald Rumsfeld, at the time, U.S. Secretary of Defense regarding the existence of Iraqi weapons of mass destruction generated much discussions around the world (Dod, 2002). The same idea applies to the organizations, how can they know how to react to threats/opportunities that they don't know they don't know? An example is the finance sector not knowing until 2009 that a decentralized currency solution powered by blockchain would be possible and available worldwide [1].

With an understanding of this context, this thesis introduces a theoretical framework capable of connecting the information from internal and external environment to the organizational strategic plan.
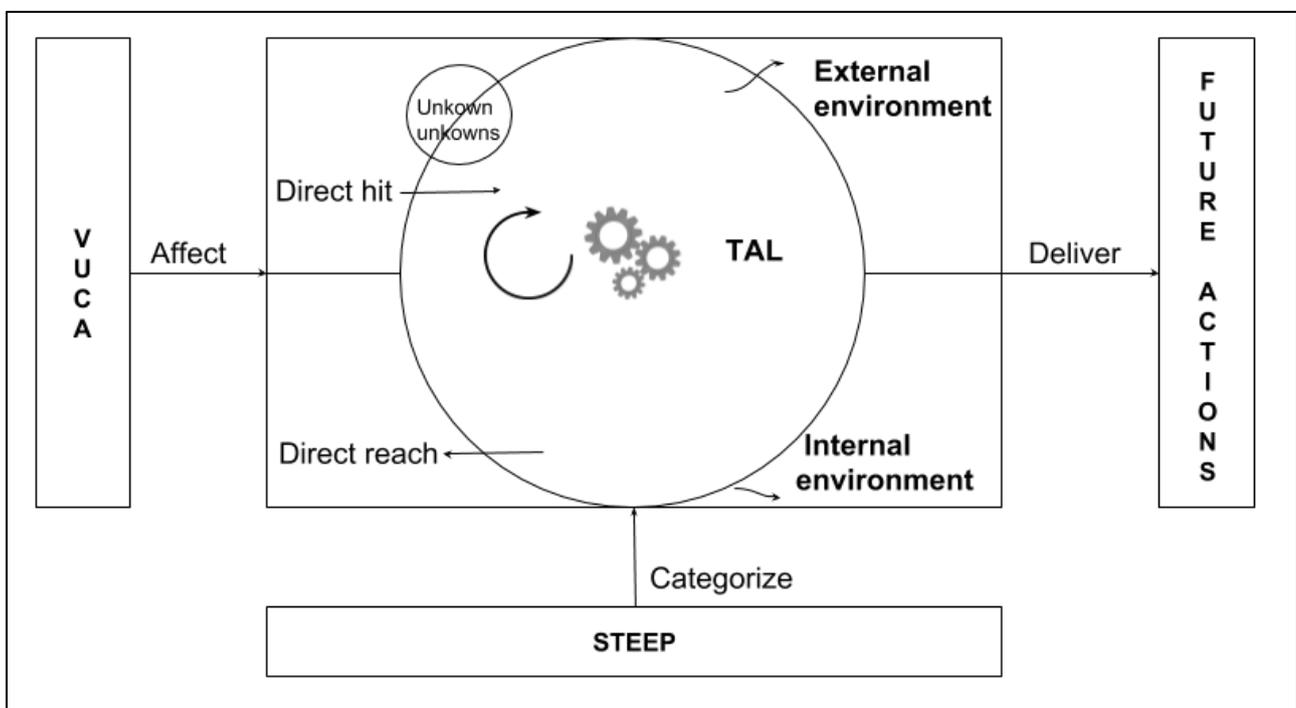
Figure 5: Trend tracking framework capable of merging internal and external environment information

There are five components of future-oriented knowledge in the proposed conceptual framework (Figure 5). At the center, the organization lies within two realities, the internal environment and external environment which as already discussed, will incur in a direct hit or direct reach. The presence of an unknown unknowns area in the boundaries of the

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[1] In January 2009, Satoshi Nakamoto (unknown identity) released the paper "Bitcoin: A Peer-to-Peer Electronic Cash System". Until this date, no possible implementation of a reliable and secure currency without a centralized clearing house to validate the transactions was known.

organization represents the fact that no matter which researches or techniques are being used, there is always going to be an information that will not be retrieved.

On the other hand, the trend-awareness layer (TAL) is the core component, responsible for filtering and translating the information of the outside world, fitting them to match the internal needs and reality.

In TAL, the resources and process of the organization (internal environment) are identified and compared to the signals coming from the external environment. This step is important to understand possible optimization opportunities processes and resources.

The process of TAL consists in: (i) understanding the external environment, (ii) understanding the internal environment, (iii) establishing relation with VUCA, (iv) creation of future action plans.

As an example, consider a fictional multinational car rental organization named CAR-GO, the decision-makers want to understand how the trend of global warming that is generating catastrophic climate changes will affect their environment. When analysed with a VUCA angle, they found that this is an environmental trend with a predominant volatile behaviour. In TAL process, gathering information resulted in the understanding that catastrophic climate change will not affect the organization in the next 5-10 years because all the fleet is being already converted to electric cars. Therefore, reducing the organization's carbon footprint and avoiding future tax costs related to oil cars.

Interacting with the organization, the VUCA environment affects the current reality while the STEEP analysis helps on categorizing the trends accordingly its domain area. The convergence of each of these interconnected parts delivers future actions points aligned with the reality.

3.2. Understanding the external environment

In order to have a bigger clarity of the external environment (Figure 5), the organization needs to concentrate its limited resources such as time and money in investigating the areas of the external world that holds the biggest chance of impact on the future of the organization.

Reduce the infinite number of possibilities to a trackable amount of data with a boundary, even if its content is unknown, will enable the organization to process the information before it is too late, meaning, when the future is already present (Mühlroth and Grottke, 2018). Although it is not possible to control the external environment, the following questions can be used to understand the organization's location in the "environment chaos".

TABLE 3: RELATION BETWEEN LOCALIZER QUESTION AND FEEDBACK

Type	Localizer Question	Target audience	Feedback
External	What your client would do if he could be the CEO of the organization for one day?	Client/Supplier (external)	The answer can be used to understand the perception that the client has about the organizations' products/services, actions and engagement.
Internal	Does the need to acquire new unplanned assets/technologies increased to a notably large extent in the past two years? If yes, which assets and technologies are you thinking of?	Stakeholders and internal clients (internal)	Indication that the environment is changing faster than the organization is keeping pace of.

With the ever growing amount of data, most organizations are not capable to analyze the large data volume (Abbas, Zhang and Khan, 2014). In this context, the importance of tools and methods to help experts in data extraction and knowledge analysis has increased (Fayyad and Uthurusamy, 1996). Seeing that, the "Localizer Question" is intended to gather strategic information. This simple question can be asked directly through social media such as Reddit, Facebook and Twitter or involved in a marketing campaign targeted to the most active customers or suppliers.

A localizer question can be perceived as an important source of knowledge that is only correctly retrieved if the right question is asked. That information will provide a sense of direction and location in the present environment.

The feedback from the first question provides valuable characteristics on how the organization is perceived in the external world and what the clients expect the organization to do in a near future.

Also, aligned with the idea of understanding the external environment, a specific internal question is considered to challenge the first one. The second "Localizer Question" is oriented to expose an external environment not aligned with the organization's strategic plan. This question should be answered by the decision makers of the organization.

To conclude this stage, a trend searching initiative is important to acquire an understanding of factors of change to avoid a hard direct hit.

Given the large availability of quantitative and qualitative methods for future-oriented technology analysis, the foresight methods can be chosen at will when applying this framework. In this dissertation, the methods endorsed are trend research and weak signals combined with VUCA and STEEP analysis.

3.3. Understanding the internal environment

Normally, organizations have a core process, the reason of its very existence. Be a bank offering financial products or a car-making transforming metal in cars, there is a commitment in processing an input and delivering an output with an aggregated value.

Therefore, the organization must be open for changes in order to adjust its process to match with the reality of the external environment (Ansoff, 1975). Since the environment is in constant change, the process aforementioned is an infinite and iterative one.

One of the key aspects of knowledge management is social activities (Ekambaram *et al.*, 2018). Therefore, this thesis considers that promoting conversation with employees to understand the details and challenges of the internal environment and find new ideas for projects is a powerful strategy.

The aim of this exercise is to gather information that is not upfront known by the decision makers and to have an end-to-end view of the internal environment by the vision

of the employees. An all-hands meeting, brainstorming and mentoring sessions can be applied.

3.4. Joining both worlds

When looking to the interaction of external and internal environment with the organizations, as depicted in figure Figure 5, it becomes clear the need of a "translation layer" that will adequate the acquired information to the reality of the organization. Therefore, this dissertation proposes the Trend Awareness Layer (TAL), the last and more important part of the Trend Tracking framework.

Since the information that comes from the external environment is so big, the organization needs to focus in reliable, traceable and meaningful information. Fake news, non-verifiable or biased data should not be considered since it will only contribute with noise instead of knowledge.

As of now, we have trends observed in the external environment and the understanding of how the organization works within its premises. Even though a trend is primarily related to uncertainty, this work implements the relation of the observed trends with its predominant VUCA environment in order to understand how to act in each situation.

Therefore, the TAL will be applied considering the different aspects of the predominant environment to create an output with aggregated value. As discussed before, the four areas are Volatility, Uncertainty, Complexity or Ambiguity. The combination of this analysis will result in the framework's strong commitments to address the future.

When the predominant environment is one of volatility, the environment is unstable and always mutating. Consequently, in TAL application, the organization needs to Cross-relate the available information with the results of the second "Localizer question" to increase flexibility. In this context, agility in response is the key.

After processing the information, the result will lead to a commitment to make the organization more flexible towards the trend it is facing and to improve the responsiveness in a volatile future.

In an environment of uncertainty, a common ground of technically all the trends, the events can create a remarkable change in the future. Therefore, the TAL application relies in filtering data based on the subject and complement internal databases, CRM and ERPs. In this context, information gathering is the key. Once the previous step is completed, the result will lead to a commitment to maintain a gold record with reliable information in the company in order to better support the decisions related to an uncertain future.

In the other hand, in an environment of complexity, in which the relation of the events is not easy to comprehend, the TAL aims at understanding the core of the complex structure that directly impacts the business. Restructuring to adapt is the key. In the end, the result will reveal a commitment to consider an aggressive restructuration in business areas or process to tolerate the pressure of complex future.

Last but not less important, there is a predominant environment of ambiguity where the cause for the events nor their effects are known. Hence, during TAL application, the organization needs to consider every possibility that comes from the external world and put it in a test. Experimentation is the key. After this step, a commitment to disseminate the results of the testing through all organization is revealed to ensure that the ambiguous case will be faced with experience and not assumptions.

4. THEORETICAL FRAMEWORK APPLICATION

The application part of this thesis focuses in the financial market. For the purposes of confidentiality, the name of the organization will not be disclosed in the course of this thesis and will be referred exclusively as "Bank".

The Bank selected to apply the framework is one of the largest banks in the world by total assets, and currently operates with a presence in more than 70 countries with a strong European operation. Nowadays, the biggest issue of the Bank's top management is to understand how to respond to the events of the external world and implement actions to maintain a competitive advantage in a highly competitive market.

4.1. Understanding the Bank's external environment

In order to understand the bank's external world, the first localizer question was divided in two questions, shaped to understand the negative perception of the clients

regarding the practices commonly applied by the banks and what could be applied to increase the client's satisfaction.

The questions were created without referencing the bank's name in order to also understand other practices applied by the retail banking sector and have information for comparison. The questions asked on Reddit platform, an anonymous discussion website with more than 200 million monthly unique visitors from around the globe, were "You are now the CEO of your bank, what would you do help the clients?" and "What is a common bank practice that should be illegal?"

With 30 comments combined, both questions revealed interesting information. A north American user stated that "Charging to use an atm", is his opinion, should be illegal. Other users, however, remembered that this is a practice more common in USA and that it was not an issue across Europe.

Another user, highlighted the fact that his bank charges for processing checks and cashier's checks, others agreed and also added the practices of posting transactions from highest to lowest to maximize the charges, charging to use an ATM and even charging to change coins into bills as bad practices. Other users believe that no fees for checking and savings accounts and lowering bank fees should be a good way to help the clients.

In addition to understand the external environment, two managers from the Bank were select for a private interview. In this talk, they shared their view about future, world topics and VUCA implications within the Bank. At the end, they were requested to answer the Second localizer question "Does the need to acquire new unplanned assets/technologies increased to a notably large extent in the past two years? If yes, which assets and technologies are you thinking of"?

According to the managers' answer, the Bank had to invest in technologies like digitalization, robotization and analytics to free the analysts from repetitive time-consuming tasks and use their knowledge to improve business processes.

In addition, buying products to implement paperless invoice processing through OCR technology and hiring experienced people were also the identified as urgent needs in the past two years.

These answers highlight the conscience of the management regarding the importance of following closely the new technologies in the market. A constant and resource-demanding task. They strongly believe that their business is not behind the market's trends such as Digital banking, Data mining and Robotization.

In order to test this belief, a trend searching step was performed to understand what are the most important trends in the financial market in the present time, as proposed in the Trend Tracking framework.

The first trend detected is the advent of sharing economy. The base of this trend consists in the sharing of goods and services by a community based on-line platform to lower the costs involved.

Through this platform, the individuals can easily rent services or goods by a period of time by a fraction of the traditional market. Good examples are the Airbnb platform, where hosts can rent their properties to guests during a time frame with cheaper prices than a normal hotel. Other examples are the crowdfunding website Kickstarter and the Coworking sites available around the cities.

Due to the large availably of internet and smartphones, interactions become less analogue each day. In this context, the digital transformation spread, is the second observed trend. The main characteristic is the adoption of technology in the most diverse business interactions to provide new shopping experiences, products and customized services.

Perhaps the best example of this trend is the Netflix that started in 1997 as a DVD rental company and later created a streaming service that revolutionized the way customers consume media. Transforming its business from delivering physical media to digital content distribution was the key to the success of the company. Others adjusted the same principles into different business, for example, Domino's pizza delivery system that let customers follow each step of preparation in real-time.

Aligned with the first two trends, the following one comes as a disruption in transactions verification and payments. The adoption of blockchain and crypto currencies has come to stay.

Crypto currencies such as Bitcoin and Ethereum disrupted the world by making use of blockchain, an incorruptible digital ledger that can be used to record transactions and act as a unique trusted source of information.

As of today, it is possible to buy goods and services using a virtual wallet containing crypto currencies or even invest in financial assets based on virtual coins. However, the most interesting innovation is probably the possibility to use blockchain in several other markets like retail, insurance and health care. An example is the application of blockchain by IBM to organize the supply chain records and being able to provide information in real time.

With the disruptive events, comes the legal questions. The fourth trend, Regulatory restructuration, shed light in this matter and shows that an adjustment of the law to accommodate the innovation is necessary. The legal battle of Uber in several countries and the fact that cities such as Paris, Barcelona and New York regulated the short-term rentals due to Airbnb operations are examples of how the laws are affecting new business.

4.2. Understanding the Bank's internal environment

Once the external environment is addressed, the necessity of understanding the internal environment of the Bank's becomes relevant. Following the Trend Tracking framework application, this was achieved by gathering all the employees in an event which the main objective was to empowers them with a voice to share their critical vision about the business processes, their daily tasks and the Bank's structure.

With a presence of around 70 workers, the event took place in a convention center located outside the stressful financial district. Together with job-related activities such as All Hands meeting, feedback result and people survey but also networking sessions and sports activities, the all-day event aimed to provide the top management with a reliable view of their internal environment.

The business unit's structure contains top management, middle management and analysts. In addition, the activities are divided in two big groups, a business analysts team working together in the same building and a team of technical analysts located in another country.

By the end of the event, ten initiatives were identified with the workers as important facts to be developed. In order to better organize the result, the initiatives were divided in four action areas: Communication; Objectives and Performance; Operational Efficiency and Leadership.

TABLE 4: EMPLOYEE FEEDBACK ORGANIZED BY ACTION AREA

Action area	Initiative	Description	Responsible
Operational Efficiency	Technical team questionnaire	Team will be invited to respond to questionnaire about how to improve the work with the technical team	Top Management
	Technical team Workshops	Workshop to understand the technical team's new Agile approach	
	Team event	Team building event to share job and life experience	
Communication	End-to-end process view	Each team should create a presentation of its responsibilities and daily tasks to share with the colleagues of the business unit	Top Management and Analysts
	Lunch networking	Promote an informal channel of communication between the team members through lunch sessions	
Objectives and Performance	Create an appraisal cycle	Need to create an appraisal cycle to better evaluate the analysts	Top and Middle Management
	Knowledge sharing	Identification of specific competences and experts in business unit and posterior knowledge sharing activities	
Leadership	New joiners KIT	Facilitate integration of new hires and provide better support to the new joiners	Top Management and Analysts
	360 review	Implementation of 360 review and mid-year review	Top and Middle Management

		practices to improve feedback	
	Team meetings	Participation of upper management in team meetings once per quarter	Top Management

4.3. Joining both worlds

At this stage, the Bank has the trends observed in the external environment and the understanding of how the organization works internally. However, it is still necessary to understand how the trends can affect the Bank's reality and derive commitments to drive the future actions.

Since the identified trends can shape the future of financial sector in multiple ways, a more specific analysis was required, as proposed in TAL. In the following paragraphs, the information is classified by area, predominant environment and analyzed from the perspective of the financial market. As a result, four commitments towards the future were identified.

The advent of sharing economy is a social trend that affects the products and services offered by the Bank. The clients are moving away from traditional banks and using services like TransferWise, a company that offers money exchange with a lower spread and gives the possibility to add the amount in the prepaid credit card to use anywhere.

Given the characteristic of a predominant uncertain environment, it is possible that this kind of company will have an even bigger role in the future. The clients will be able to choose between using the services of a well-known bank or a specific fintech which empowers the community through an online platform.

After gathering information inside the ERP's master data, it became clear that the data regarding both clients and vendors are not complete.

This context leads to a commitment towards rebuilding master data information and create new platforms to implement an online hub capable of offering multiples services with reduced costs from a group of partner banks using just one common account, for final clients and vendors alike.

The spread of digital transformation is a technological trend that comprises all the disruptive technologies like artificial intelligence, big data, data mining, RPA and cashless payments. Its predominant environment is one of volatility.

After combining this trend with the answer of the second Localizer Question, became clear that the Bank's decision makers are aware of what happens in the external environment regarding the importance of adopting new technologies.

Therefore, the commitment generated is to increase the utilization of disruptive technologies to better the flexibility and agility of the Bank's operations. Using technology to reduce the processes difficulty is the key to stay relevant in a highly competitive financial environment.

This importance is currently being perceived in the adoption of blockchain and crypto currencies. This technological trend belongs to an environment of ambiguity.

The big disruption caused by this technology and the fact that no one can predict how it will affect the future, meaning that it could be irrelevant in the next five years or become the base of every transaction, is the starting point for extensive experimentation.

Therefore, the commitment derived is related to the testing and creation of prototypes to understand how blockchain and crypto currencies can contribute to the Bank's business. As an example, the Bank can experiment on creating a system to add the information of clients and vendors in a blockchain in order to ensure data validation and consistency.

Following the previous trend, comes into sight the need of regulatory restructuration. This political trend is being pushed globally by all the governments because they see the need to implement new regulations to face the changes in technology and society.

These specific laws and agreements create a very complex environment that the Bank's need to consider to maintain its operations aligned with the regulatory compliance.

Compliance expectations, particularly regarding the information treatment and dissemination like the General Data Protection Regulation regulation in Europe, will become even more common. Thus, adapting processes and investing in resources to fight this direct hit will be indispensable to remain inside the legal boundaries.

Therefore, the final commitment identified is the importance of understanding the particularities of the laws in each country that the Bank has operations and implement the actions needed in the business strategy to stay compliant.

5. CONCLUSION

Compelled by the force of curiosity and sense of uncertainty, the organizations are always trying to get a glimpse of the future. Even though it is not possible to see what lies ahead, the organizations can analyse the key events and forces that will probably shape the future.

Therefore, in the previous pages we developed a conceptual framework aimed at combining the trends of the external environment with the organizational internal environment information to generate future oriented actions and contribute with the managers in the decision-making process.

The strength of the framework resides in the capability to accept several instincts from the outside world and apply in a specific step, named TAL, dedicated to filter and process this huge amount of information in accordance with the company's internal environment.

Understanding what the observed trends meant to the Bank's reality was a key step to align the strategy with the inputs received. The difficulties found during the process were related to the commitment of the employees in answering the questions, filtering the more relevant trends.

The first one was solved by encouraging the discussion and the later one, by reducing the scope of analysis to the financial market in Europe. After the application of the Trend Tracking framework, the management observed characteristics of business processes and constraints in the daily activities that were previously unknown.

As a result, the Bank had evidences of its correct alignment with external trends in European market such as robotization and digital banking. Another observed indicator was the increase of turnover in operational teams due to a lack of a clear career path.

The results of the framework application indicate that it is possible to analyse the organization's world by making a correlation between the VUCA predominant environment, trend classification and available information. All combined to generate

valuable commitments aligned to the future. A powerful competitive intelligence tool to decision-makers.

Nonetheless, even though the commitments can be translated in actions that are better aligned with the future, the outcome is not stable and certain. This means that the unknown unknowns and drivers of change are a constant threat on the path to the future.

Therefore, the organizations need to be vigilant and apply the Trend Tracking framework along with other future-oriented technology analysis tools in order to periodically reduce the risk of unexpected events when planning the future.

For future research, it would be interesting to investigate how the Trend Tracking framework can be adapted to an algorithm. The algorithm should be able to receive the inputs in a structured form and propose commitments based on machine learning and neural networks by using a database of trends and facts.

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7. ANNEX

How to address the observed trends:

To better comprehend the explanation above, consider a fictional multinational car rental organization named CAR-GO. The Framework's result on how to act regarding the future is addressed in the following paragraphs.

Consider the trend of global warming that is generating catastrophic climate changes. That is an environmental trend with a predominant volatile behavior. In TAL step, gathering information resulted in the understanding that catastrophic climate change will not affect the organization in the next 5-10 years.

However, diesel cars will be banned in a near future and the Localizer question exposed that in the past two years, CAR-GO spent a huge amount of money renewing its fleet with diesel vehicles to save on gas costs.

The generated commitment is that CAR-GO should focus on adoption of electric cars and ride-sharing solutions to reduce the costs, contribute with lesser emissions and ease the impacts of an upcoming diesel ban.

In another analysis, the concerned trend is the aging of population, a societal trend with a predominant uncertainty behavior. After querying their databases in TAL step, CAR-GO realizes that the number of senior clients is bigger than expected but the details of these clients are not complete in the Customer Relationship Management system.

The generated commitment is that CAR-GO should focus on an approximation to senior clients in order to update their information and needs. This can lead to the creation of a specific product aimed to seniors clients to admit this trend.

In another country the management is worried about the increase in good's tariffs or quotas on import as a result of trade war, a political trend with a predominant complex behavior.

After researching the structure of its several businesses around the world during TAL step, CAR-GO learned that its current business model in the middle of a trade war could implicate in a huge increase of tariff costs impacting the earnings after tax (EAT).

In this case, CAR-GO commits to restructure a portion of its car business and register the cars in the original country headquarters instead of an offshore country to avoid a future surge in taxes.

The last example is the application of blockchain technologies in different areas of research, an economical trend with a predominant complex behavior. CAR-GO is considering a new form of operation and after TAL step, believes the answer lies within the blockchain technology.

After extensive experimentation, CAR-GO creates a proof of concept product. At the time of return, the vehicle is not verified by a CAR-GO employee but by several clients in the location whom will receive, for their effort, points to be used in other services. This is an example of a commitment of extensive experimentation.

It is important to highlight that the presence of an unknown unknown event is constant and can manifest anywhere in any form. Therefore, CAR-GO must be always prepared to use the commitments found to reduce the impacts of a huge shift in the car-rental business dynamics.