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Intelligence analysis and cognitive biases: an illustrative case study

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ABSTRACT: This case study is foremost an educational tool. It involves two European and Asian multinational tires manufacturer for OTR, Off the Road, or “off road” and a problem of price competition. It shows how an initial intelligence effort is led astray. Instead the solution is a combination of approaches, better known as Competitive Intelligence. It is built on the external vision of the company craft, the use of all information sources characteristics of an intelligence field dedicated to the business world. It is not a new discipline but a trans-disciplinary approach for information exploitation which is using elements from financial analysis, SWOT (strengths, weaknesses, opportunities, threats) matrixes, and value chain analysis. In the above case, the company Eurotires used mostly the following sources: internet, scientific and patent databases; public administrative sources; customers interviews, industrial experts (manufacturing and distribution), and marketing analysis.

KEYWORDS: Intelligence analysis, competitive intelligence, Cognitive bias, case study

1.0 Introduction

“Cognitive bias is a common tendency of filtering input through one’s own likes, dislikes, and experiences to acquire, retain, and process

information » (Black, 2014). This phenomenon is well documented, studied, and identified, but is it known by most of the people having to make decisions? In order to limit the range of what ‘making a decision’ is, we will focus on a specific

case: information analysis in a commercial environment. This case study is illustrative as it groups analytic methods' applications and several biases.

The author, when conducting a competitive intelligence project, was confronted with a double cognitive bias syndrome: personal biases but also ones indigenous to his customer's culture. Recent researches have been conducted on how a second language reduces bias in analysis (Wheaton, 2013).

Language is part of people's culture and education. But a company's culture is more complex because, in addition to the employees' backgrounds and educations, a company creates a specific environment: employees from various regions, educational tracks, working on various issues and markets. In this case study, the origin of the bias was the organization's behavior, another important factor.

The analytic methods themselves can create a bias: they have their own history, origins and applications. Does a military intelligence method apply to economic issues? Does a scientific method apply to international relations? In this case, the methods first used were technologically oriented when the solution was organizationally, logistically and commercially oriented.

We can call this difference of original field of application a dimensional difference. Despite the fact that involved employees, mainly engineers, and analysts master these various methods, the cultural and dimensional factors became predominant resulting in four months of vain research, misunderstandings and time/money spending, a common problem in the business world.

The full case study will present all the factors, reflections, methods used and *a posteriori* (by observation) noticed biases in a cultural perspective, from language to education, behavior, interactions and finally how the solution was found. But this case study is foremost an educational tool as it allows us to cover various issues from analytic methods to intelligence production, and from organizational behavior to personal/group/corporate biases.

Solving this case is not a question of mastering analytic methods or having an experience in the industry or as an engineer. We have conducted this case study with students of different levels (from Bachelor to Master/MBA) several times and the

solution can be found without any experience of tires manufacturing or supply chain management. Surprisingly, students with a basic training in information collection and an access to information sources are the least efficient or effective in finding the solution. This is because they are searching without clear instructions, tasks sharing, and never stop (which can become a bias by itself), they don't produce even partial outcomes which is an essential part of the intelligence cycle.

From our experience the best results from this test were obtained by using five groups of four or five students without any access to information sources. Instead of searching, the students were exchanging ideas, testing solutions between themselves with similar perceptions among the different groups, a kind of competition or comparison.

This business case, from which we deduced some practical tips for further analytic case studies, should lead to further research on other actual cases and comparisons. From a research perspective, it would be useful to compare engineers, production managers or decision makers' personality profiles and their ability to analyze problems from different domains. But as noted, the most interesting lesson of this scenario based training is the collaborative analysis of the students without information.

Students and groups were sharing information, despite the fact it was not authorized by the trainer: as quoted in a recent publication analysts, using "effects of implicit sharing in collaborative analysis" (Goyal, 2014), were, in our case, more efficient in finding the solution than other teams working alone in structured and separated groups. Based on this experience, we could hypothesize that analysts without information access or inferred biases may be more efficient than skilled and trained ones.

The case study is structured as a didactical scenario to be played during one or two full days. The first day is dedicated to the presentation of the base assessment; the challenge being for each group to follow the initial research phase. This generally leads to a similar conclusion: the students don't find the solution. From time to time, the author delivers information inputs, answers some questions and even tries to lead students down wrong tracks.

As already noted, the most interesting phenomenon is not the research's results, but how the students reflect and interact as teams. Some search endlessly

for solutions; some state hypotheses; some inject their own experiences: but most of them don't cast doubt on the base statement nor the research logic. As we will see, this reaction follows what happened during this case study.

The second part of the day, or the second day, it is necessary to give students clues not to solve the case, but to eliminate different hypotheses. Most of these hypotheses are linked to the low costs production issue as the most logical explanation. The case is structured to make students react, make them think about how they reflect, and create frustration in them. As stated, not all the students find the solution, or even a part of it. The limit of this approach is the constrained training period.

At the end of the day, or day two of the session, there is a mandatory evaluation phase and the conclusion giving the solution. As much as possible, these phases must remain interactive, as the previous ones: the solution is not just released but the students might deduce it from more and more precise information or clues. The case below might be seen as the transcript of these training sessions, from the beginning to the conclusion.

The authors gave different type of training sessions, from a more lecture-oriented session to this interactive approach. It groups together research techniques--inputs to analysis and evaluation--based on a real case. Students can discover information, enhancing their involvement. They interact and it is interesting to see how groups are formed: if the mix of student competencies are arranged randomly or based on persons' proximity and personalities.

Is it possible, inside a company, or a governmental body, to mix various backgrounds and personalities in order to optimize the brainstorming? The answer is logically yes but as we will see, some biases were induced by the variety of backgrounds and professional behaviors involved. Putting the participants in a 'think out of the box' situation would be the solution: outside of the organization; making hierarchy a low priority and using an engaging situation such as war games or serious games.

2.0 The OTR Case Study¹

¹ Disclaimer: despite the fact that the facts and details presented in this article are realistic, as is the

In 2003, a European tires manufacturer ("Eurotires") was hoping to understand how one of its Asian competitors ("Eastires") offers to its customers "40% discounts on sales prices for the Off The Road ("OTR") segment". OTR is a small business segment, compared to other companies' segments, but very competitive and the technical: tires for mining or construction machines have specific characteristics. In this case, for Eurotires, the logical explanation was that Eastires has invented a new manufacturing process, but after several months of internal technological and industrialization research, this explanation appeared as not true. Eastires did not invent a new process, did not modify its manufacturing lines, and had not changed its suppliers.

But a 40% discount is a significant drop on the sales prices if we consider the normal industry profit margins of a few percent. Eurotires interacted with customers in order to see if the tires themselves have changed. From Brazil to Australia, USA to Japan, the main customers were contacted, including construction and mining companies and airlines companies; airplane tires being a sub-segment of the OTR market. Research was conducted with the end users, mine managers or airlines technical services. Once again this track did not lead to an explanation. Users did not observe radical changes in the tires technical characteristics: Eurotires considered that, due to specific constraints these tires support, technical changes were the explanation.

Eurotires is a company of engineers; thus the solution was necessarily inside the tires. Thanks to publicly available information, Eurotires was able to analyze the chemical rejections of one competitor's factory. This analysis did not show particular elements for the R&D department. So a reverse engineering approach to solving the mystery was not successful. Studying the scientific and professional publications made by Eastires inside industry or research centers journals revealed there was no particular tires' components change. Then researchers tried to determinate if the

analysis based on them, the names, industry and locations have been changed due to confidentiality issues, but chosen because they present the same characteristics as the original case. Similarly, the expressed opinions are only the ones of the author.

mechanical characteristics of the tires were changed, using laser testing benches. They did this with the belief that, you can gain in productivity by automating the testing process.

Eastires' suppliers for raw material and machinery were well known and often the same used by Eurotires. Previous research phases showed that no particular changes occurred for supplies or manufacturing lines. Eurotires did not succeed in analyzing this 40% discount. At this stage a consultant suggested to widen the research outside the engineering approach. The idea was to analyze the whole value chain of the manufacturing of the tires from conception to raw materials, to manufacturing, to sales, to distribution and to services. The first three steps were analyzed without finding enough factors explaining this price drop.

Could the solution be in the following steps? In fact the attention of Eurotires was focused on the production costs while the customers were speaking about sale prices. OTR tires, due to their specific uses are distributed through specialized resellers (independent or brands owned) or directly shipped when orders are important enough. For example, mining and airlines companies are regular users of OTR tires. Airlines are submitted to security constraints which oblige them to change tires when they reach a determined level of wear. Mines don't have the same constraints but must reach production and profitability objectives. Mines have a specific characteristic as their own supply chain is constrained: ores are transported either by trains or ships from often isolated regions (Southern Chile or North West Australia).

In both airlines and mines cases, too frequent tires replacements, or not planned ones, lead to delays, production decrease and thus exploitation losses or even financial penalties from their customers. These two industries have a common characteristic: they can precisely plan the utilization of their equipment and then the tires' wear. Planes' rotations are planned on long term, so the number of take offs and landings, the main wear factor, and the runway rolling distance are known. A mine can be compared to a manufacturing line: each machine has a determined function and does not change; trucks have always the same itinerary, loads the same weight, on known distances and grounds (more or less abrasive).

These two industries can coordinate with their suppliers, including tires manufacturers, precise replacement parts needs on a long term basis (depending on the economic activities: evolution of flights programs or variation of the ores demand). Maintenance services of concerned companies have tires stocks but limited in order to optimize stocks costs. In these conditions, a tires manufacturer can offer a 'just in time' service, the exact number of tires being delivered 'on time' based on the constrained replacement program. This planning can be done for existing customers and large quantities, emergency replacement or new customers/sites being specific cases. The 'just in time' service presents advantages both for the customer and the supplier.

The customer is ensured to not suffer delays in a plane's rotation or production interruption. The supplier can plan its own supplies, manufacturing programs and products delivery. All these elements can be translated in financial terms.

Has Eastires been able to precisely simulate its activity in order to offer such a discount representing an optimization of its production and post-production costs? Eurotires discovered that its competitor, present in Asia, North America and Europe has gone further with this planning approach, making concurrent commercial strategy, supply chain and production. In fact Eastires has changed its function. Instead of selling a number of tires, Eastires offers a service, providing for a predetermined period, a permanent availability of tires, delivered on time at the right site to synchronize with its customers' business cycles. From a commercial point of view, Eastires offers its customers multi-year service contracts in return for which the manufacturer negotiates a significant unit price discount. More than production, and supplies, including its own raw materials and transport prices negotiation, Eastires can guarantee to its shareholders several years of visibility in terms of turnover.

2.1 Analysis methods convergence

This case study demonstrates the necessity to use varied analytic methods since a strictly scientific approach (R&D, components, processes, patents) was not appropriate as the solution was outside this domain. Tires' performance and wear indexes were known due to manufacturing monitoring; the manufacturer can predict the replacement time. This technical factor, despite not explaining the price

discount, was essential to define the commercial strategy and negotiations. The upstream supply chain analysis did not show changes explaining the price drop (same raw material, same transport means, and same delivered quantities).

It's possible to find the solution by combining these different approaches, the specific needs and constraints of the customer. This combination of approaches, this external vision of the company craft, this use of all information sources, are the characteristics of an intelligence field dedicated to the business world; competitive intelligence. It is not a new discipline but a trans-disciplinary approach for information exploitation which is using either financial analysis, SWOT (strengths, weaknesses, opportunities, threats) matrix, or value chain analysis.

In the above case, Eurotires used the following sources: internet, scientific and patent databases; public administrative sources; customers interviews, industrial experts (manufacturing and distribution), marketing analysis.

This approach allowed the company to reconstruct its OTR distribution organization, from manufacturing factories to resellers stocks, distributors and users. OTR tires have long life cycles, low margins, good planning potential, a second hand market and a constant demand. Eastires objective was to effectively provide a solution for this predictable demand at the best price. It's a supply chain re-engineering with economies of scale, precise planning, which leads to upstream and downstream logistical chain organization.

These supply chain levers have direct consequences on financial results: logistical costs optimization, negotiations on large amounts of raw materials, production planning depending on the country and demand's cycle; stocks optimization and human resources organization. The 'just in time' organization has another consequence: there is no more delay between orders and deliveries as Eastires anticipate needs and on site deliveries. Eastires has also improved the after sales services: used tires are collected, new ones are mounted on site and there are fix or mobile recasting units to reuse the tires: refitted tires are authorized for planes and it's a useful option for mines, when security criteria are respected.

The supply chain management is optimized by influencing costs, prices and services. Thanks to this, Eastires won market shares by differentiating from its competitors while improving its profitability. For OTR tires, heavy and bulky, logistic costs are high (factory, transport, distributor, and user). Eastires, considering its quality of services strategy, should even internalize distribution under its own brand in order to lower some costs and improve its image. One way to reduce costs is to optimize huge shipments towards important market areas and then break down the distribution to specialized companies: to identify these portions is also possible.

2.2 Open information and anticipation

Existing customers, and their premises, are well known: an airline is not created from one day to another and a mine does not appear from nowhere. More, due to heavy competition and economic situation, we can observe a concentration phase in the airline and mining industries. Means of production and routes of shipment are easily identifiable, due to the specificities of OTR tires. Many logistic companies' records, and even customs data, are made available on internet or through industries experts. Even if this market is specific, we can extend this analysis to various sectors. Monitoring information sources to identify new commercial leads, best practices benchmarks and innovative strategies is a permanent task that any company might conduct using legal and ethical methods, which are the characteristic of competitive intelligence.

Why was Eastires able to identify key success factors, while Eurotires took so long to identify the same information? Eastires succeeded because the company took into account all possible elements and sale steps, not only production issues. This strategy can be duplicated because: it is not dependent on technology; the number of actors is limited, as the number of suppliers and services providers. Similarly, tires for transport trucks are not anymore seen as products but services, the user paying a fee based on kilometers and the manufacturer being in charge of regular maintenance and replacement. This service approach is also used in the heavy machinery business: Caterpillar also offers its customer to anticipate their needs and replace/repair parts in their machines.

3.0 Analytic cultures and biases

Despite the fact that Eurotires lost some market share in the OTR segment, the company is a leader on the global tires market. Once the key success factors and organization used by Eastires were known, Eurotires set up the same kind of pivotal logistic centers; specialized distributors that were able to repair and recast tires, and adapted its contracts with customers.

With its important industrial capacities, present worldwide, Eurotires has rapidly regained the lost terrain. However, we can state that Eurotires faced a strategic surprise and, without external intelligence, would not have been able to adapt its organization in the long run. Eurotires engineers and researchers are at the top of their profession, with universities R&D collaborations worldwide. Commercially speaking, they are in contact with their customers. So why was this leading company surprised?

We can assert that such kind of strategic move is not really a surprise which is by definition something we cannot imagine and thus anticipate. Was that the case for Eastires? No, the company had simply reorganized its existing means of production and distribution to articulate a new sales strategy. As we saw the company did not invent a new manufacturing process, did not change its production lines, its suppliers and service providers. At the beginning, Eastires did not gain new customers but consolidated and retained existing ones. And Eastires did not communicate its reorganization. So, was it Eastires that took the initiative or Eurotires that did not watch its competitors' moves and customers' needs? At this stage of the case it could be helpful to stress how the initial information was collected and analyzed, along the lines of Cognitive bias and information collection (Margit and Grosjean, 2012)

The information source was a commercial agent visiting prospective customers who told him that Eastires was offering a 40% discount on sale's price. But when expressed inside the competitive intelligence request, this was redacted as: 'a 40% decrease of the sale's price because Eastires has a new manufacturing process'. This is not a bias by itself but a falsification of the information which resulted in useless research and internal misunderstandings. But this can also be seen as a 'framing effect', the fact to elaborate "different conclusions from the same information, depending

on how or by whom that information is presented" (Ackerman, 2003, p.7). The consultant did not collect himself the raw data but received an interpretation from Eurotires management. The first error was to not request a direct contact with the source.

From a consultant perspective, it can be hard to cast doubt on a customer's opinion and request. The customer, in that case the R&D director, was using misinterpreted information as true and expressed his opinion as a logical conclusion. This can be seen as 'subjective validation' the "perception that something is true if a subject's belief demands it to be true" (Iverson, Brooks and Haldnack, 2008, p. 248). In that case, as quoted, the customer was an industrial company focused on its technology. So for the R&D director, the obvious solution for a price change is technical and this despite the fact that the information was clearly commercial or at least financial. So for him, any other explanation does not satisfy his belief, or personal explanation.

So even the absence of confirmation, from his initial research, and the consultants, was not a noticeable fact. This can be seen as a reversed confirmation bias, the "tendency to search for, interpret, focus on and remember information in a way that confirms one's preconceptions" (Tversky and Kahneman, 1974, p.430). At each mission's intermediary report, the absence of facts was confirming the belief of the director that Eastires has really innovated in a secret way. So it was necessary to keep on searching and using different sources and methods, as described. And despite the fact the initial mission's request was apparently erroneous; all parties decided to keep on spending money and time to look after the hidden innovation. The economic relation between the customer, an industry leader, and the consultant, a specialized but much smaller company, also played a role.

It's a question of technology knowledge, the gap between industrial experts and management consultants. Even if these last can improve their sector's learning curve for each new mission by interacting with experts, they don't have the experience and the education background to understand all facts and data. This can be seen as a 'curse of knowledge' "when better-informed people find it extremely difficult to think about problems from the perspective of lesser-informed people" (Ackerman, 2003, p.7). Each collected element was judged as irrelevant by the customer, as not as

technical as expected, and not confirming the director's belief. The main mismatch was the fact that the initial information, the technology belief and the real explanation were not in the same domain. Due to his educational background, and company culture, the R&D director did not find the information, or the lack of information, relevant.

In a way, the solution had technology factors since Eastires would not have reached this result without an efficient manufacturing line, able to produce requested quantities, a complete information system from customers to distributors and support companies to the manufacturer, and the ability to recast used tires. Even if tires are simple products, their production and quality proofing are based on technology. In these conditions, why would the solution not have been technological? This can be seen as an anchoring bias, the "tendency to rely too heavily, or anchor, on one trait or piece of information when making decisions" (Iverson, Brooks and Haldnack, 2008, p.248). This preconception led to a misinterpretation of the collected information. The technological explanation and the logistical/commercial explanation can be seen as two unrelated elements so there was not a correlation in terms of analysis (Tversky and Kahneman, 1974, p.430).

3.1 Analysis and organizational behavior

Why did such an experienced manager not look into account disconfirming evidences? Despite the fact that the collection methods were all legal and ethical, as the Society of Competitive Intelligence Professionals define it in competitive intelligence best practices it publishes, they covered a large array of means and variety of information sources (Fehring and Hohhof, 2006). The fact that no patent, scientific publication or industry journal was evocating any specific innovation should have been a disconfirming evidence for the initial intelligence statement. This is defined as the 'backfire effect' "when people react to disconfirming evidence by strengthening their beliefs" (Sanna, Schwartz and Stocker, 2002, p. 497). It took four months for the consultant to explore all possibilities, write several detailed but meaningless intermediary reports and finally conclude there was a problem of mission's request.

The consultant and the customers were also confronted to the 'observer-expectancy effect'),

"when a researcher expects a given result and therefore unconsciously manipulates an experiment or misinterprets data in order to find it" (Skepdic, 2014). As the collected elements were not confirming the initial request, they were misinterpreting these in order to keep the request as the only relevant information. The most interesting point is that the answer was "obvious" and was even given by one contacted source, an industry journalist who gave the consultant a clue when discussing the price's drop statement. Since the initial request was considered as valid, it was used as a 'Key Intelligence Topic' (KIT) in order to determine the consecutive 'Key Intelligence Questions' (KIQ) and thus list the Intelligence Indicators which are the possible elements to answer the questions (Herring, 2005).

So the whole collection plan has been determined and planned by the initial request. This having been proved as erroneous and misleading, the whole intelligence process, from planning to analysis, production and dissemination was going on the wrong track. In addition to the other biases of the collector/analyst/consultant, we can quote the 'congruence bias' the "tendency to test hypotheses exclusively through direct testing, instead of testing possible alternative hypotheses" (Iverson, Brooks, and Haldnack, 2008, p. 248). All the collected elements were tested following one unique hypothesis: a technological innovation has allowed Eastires to reduce its production cost and thus lower the sale's price. Before the four months of endless research for the mysterious innovation, no other hypothesis derived from the initial request has been tested, without even casting doubt on the request itself as expressed by the customer.

This is also a form of 'conservatism', the "tendency to insufficiently revise one's belief when presented with new evidence" (DuCharme, 1970, p. 66). We stated that this phenomenon was reinforced by the financial relation between the consultant and the customer, the technological aspects mastery and the wrong orientation of the intelligence process. The conservatism, respect of beliefs and conclusions of an older and more experienced person, can be explained by the initial education of any person: it's a form of social bias. In the hierarchical organization of any company, whatever be the model, there is a structure, especially in old heavy industrial companies, which has a direct impact on the information circulation, sharing and analysis (Fischhoff and Chauvin, 2011). If Eurotires is since a

long time a globalized company, with suppliers, factories and customers worldwide, it remains a traditional company with a strong national identity.

Most of the main managers and executive directors are from the same culture, educational background and even often from the same school. This organizational behavior, engineers selling technological products with a long history of successes and innovations logically is a specific approach to any problem, even more with this 'mate's community' managing the company (Watkins, 2013).

The consultant, while not from the same background, was from the same culture and using different languages to collect elements and redact reports. All elements and sources were in English, or else, speaking and thinking while the 'intelligence' was produced in French. The clue given by the journalist was translated in French and then sidelined as to confirm the initial request and KIT. Next we have to ask, what would have been the methods to improve or prevent these biases, from a consultant and a company perspective?

4.0 How to educate decision makers

The consultant, while not having a long experience, was aware about intelligence analysis and used many information sources. Most of all, he collected the clue from the industry journalist who said, during a phone interview, that Eastires reorganized its distribution, support and services systems in order to lower the delivery time and offer a prospective planning. This indication did not clearly state that reorganization had an impact on the sales price. The fact that this clue was not determinant as an indicator to answer the KIQs lowered its relevance. Moreover, the source being a journalist, not a manufacturer or a customer, this also lowers the subjective relevancy of his information. It's clearly an error if we consider the information and its sources to be quoted independently. But the answer being out of the initial request domain was the most important factor to sideline this information. Another factor was the necessary translation of the information to meet the customer's language request.

Does the language have an impact on analysis? The recent "Reduce Bias In Analysis By Using A Second Language" article quoted a study that presents essential points when put in perspective

with our case: "Emotion, language processing and cognitive biases aside, the intriguing question remains: Would you make the same decision in English as you would in, say, Chinese?"...being less risk averse means that people more systematically assessed the problem and came to a more rational conclusion...the ability to make decisions driven more by rational thought and less by emotion" (Kaiser and Hayakawa, 2012). In the above situation, the difference was between collecting in English, whatever can be the mother tongue of the sources, analyzing and reporting in French. The sources were thinking in their own languages before giving information and because of these differences, cultural and educational, they already analyzed from a different perspective.

The consultant was reporting intelligence through all these deforming lenses. If analysis methods are widely used, when redacting a document, each 'culture' has its own logic: French is using longer sentences, longer texts' structures and a different logic: the conclusion, the real intelligence input is most of the time at the end of the text following an 'introduction, thesis, antithesis, synthesis, and conclusion' model. If the introduction, KIT, thesis, KIQ are erroneous, how could antithesis, synthesis or conclusion have been relevant? With a clue not complying with the KIQ, KIT and belief, it was difficult to test different hypothesis and use critical thinking to call into question the whole process and mission. All these factors are directly linked to culture: language, education, experience, hierarchy, logic, and writing.

The consultant was also facing a biases' blind spot: the "tendency to see oneself as less biased than other people, or to be able to identify more cognitive biases in others than in one's self (Pronin and Kugler, 2007, p. 565).

Is it possible to prevent these syndromes by education? Inside intelligence oriented diplomas, the answer is yes because this is the place but even this depends of the intelligence culture of the considered country. We can testify that inside French competitive intelligence curriculums, the biases' issue, or the blind spots one, are rarely addressed because they cast doubt on the ability of students, and teachers, to call into question their own competencies, studies and experiences, not from a skills' perspective but from a personal and psychological perspective. If we consider that culture and education build up from the very

beginning, in childhood, then changing the curve of learning is difficult.

When analysts, or engineers, and managers reach their positions of responsibility, where what they say, write and decide, have practical and financial consequences, we should say it's already too late: some biases and education/work behaviors are set up. At that stage, and depending on the level of decision, there are a few solutions to solve the problems we faced: for analysts, trainings on biases and cases, or even psychological profiling to assess potential blockages and blind spots; for managers, similar trainings and for decision making profiling, it's possible to rely on standard human resources management tools as the Myers Briggs Type Indicator (MBTI) or Fundamental Interpersonal Relations Orientation (FIRO) personality tests. The training of analysts must include intelligence dissemination skills and needs assessment method or the mastery of tools like the Analysis of Competing Hypotheses. The trainings of managers should include intelligence process understanding and 'think outside the box' tools as scenario analysis or war gaming in order to make analysts live such actual cases.

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