Strategic monitoring in the Tunisian pharmaceutical industry: current practices and perspectives to boost performance

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Abstract

Strategic intelligence is an essential asset for organizations, allowing them to anticipate changes in their environment and strengthen their competitive advantage. It is designed as a strategic and dynamic capability, integrating practices for collecting, analyzing, and disseminating information. The evaluation of its effectiveness is based on various metrics, including user satisfaction, information quality and impact on decision-making. The central hypothesis of this study is that the more mature the business intelligence system, the higher its performance.

To test this hypothesis, we conducted our study in the pharmaceutical sector, focusing on the human drug manufacturing branch. The design chosen is that of the exploratory sequential scheme proposed by Creswell (2014), combining a qualitative exploratory phase followed by a quantitative validation phase, in order to identify the determinants of maturity and their influence on the performance of strategic monitoring.

Keywords: Strategic monitoring, Strategic capacity, Maturity, Decision, Performance, Pharmaceutical industry.

1. Introduction

It is essential For a company wishing to be performative to know, evaluate and optimize its organizational capabilities, defined as a set of multidimensional practices allowing the organization to operate efficiently, coordinate its resources and effectively achieve its strategic objectives. Rangone (1999) states that the identification and development of strategic resources and capabilities constitute a fundamental lever for improving organizational performance. Among these capabilities, strategic intelligence occupies a central place, providing relevant information to guide innovation

and support decision-making. An in-depth analysis of the literature reveals that the performance of this system is based on a set of key practices, mainly relating to the following dimensions: organizational, procedural, technical and informational. Jain (1984), Lesca (1994), Ramangalahy et al (1996) and Salvetat (2008) emphasize that effective

monitoring results in the intensification, complexity and cyclical evolution of its practices. However, many studies indicate that the development of strategic monitoring activities does not systematically lead to added value (Hargadon, 2002).

This study aims to determine to what extent the level of maturity of strategic monitoring practices in Tunisian pharmaceutical companies influences the satisfaction of users and decision-makers.

To answer this research question, we first present the fundamental practices of strategic intelligence, considered as a company's ability to listen to and monitor its environment. We then outline the various metrics used to assess this ability. Finally, in an empirical study, we analyze the causal link between the level of maturity and the performance of strategic intelligence.

2. Conceptuel framework

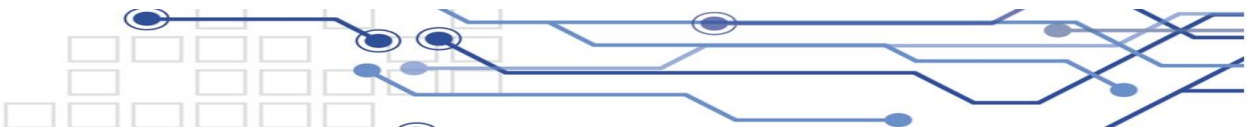
2.1 The concept of strategic monitoring

The various research projects carried out in the field of strategic monitoring do not allow for a clear, or even homogeneous, definition to be given. The literature review on intelligence allowed us to propose our definition, which largely summarizes all previous definitions and brings together several common attributes. For the remainder of our research, we will use the common concept of strategic intelligence to designate « the continuous process and efforts undertaken by the company individually and collectively (internally and externally) to monitor and observe weak signals indicating changes in its external environment, with the aim of providing decision-making members with anticipatory information that helps formulate proactive strategies and achieve a sustainable competitive advantage ». While several definitions of monitoring are given in the literature, the terminologies are just as numerous. Management literature is full of both French and Anglo-Saxon concepts that refer to the exploitation of information from the company's environment for strategic purposes, such as: Environmental scanning, Business Intelligence, Strategic Intelligence, Competitor intelligence, Corporate Foresight, Horizon Scanning, etc. his terminological diversity reflects the complexity of the concept of competitive intelligence and the variety of perspectives adopted by researchers and practitioners. It opens the way to fundamental distinctions concerning its role within competitive intelligence, its scope and its ethical implications.

Strategic monitoring occupies a central place in the field of competitive intelligence (CI), but its definition and role remain subject to debate. Two main concepts can be distinguished. The first considers monitoring as a component of economic intelligence (Paturel, 2008; Guy et al, 2001), the purpose of which goes beyond the simple collection of information to include the influence and protection of the organization in the face of its turbulent environment. The second conception equates monitoring with economic intelligence itself, removing any distinction: the terms « strategic monitoring » and « economic intelligence » then become interchangeable (Oberson, 1997; Assadi, 1998; Revelli, 1998 and Lesca, 1997). These conceptual differences also affect the moral and ethical dimension of the practice of monitoring, particularly when it borders on industrial espionage. Some authors emphasize the importance of distinguishing legitimate monitoring, based on public information and systematic analysis, from illegal or immoral practices which harm competition and the integrity of organizations. Furthermore, another frequent distinction in the literature concerns the field of strategic intelligence. On the one hand, it is considered a specific type of intelligence, focused on monitoring the competitive environment and factors directly affecting the performance and sustainability of the organization. On the other hand, it is seen as a global concept, encompassing all forms of technological, commercial, competitive and regulatory monitoring in order to constitute an integrated system of strategic information. These different debates and positions also influence the question of measuring the performance of strategic monitoring, which remains an unresolved subject today.

2.2 Maturity of environmental monitoring: assessment through strategic monitoring capacity

In the specialist literature, numerous studies have focused on assessing the maturity level of strategic monitoring systems, which we refer to as Strategic Monitoring Capacity (SMC), often conceived as the cumulative result of multi-dimensional practices. This research highlights that the effectiveness of monitoring does not depend solely on the implementation of technical tools or isolated processes, but on the coherent integration of different practices within a global system. In our article, we propose an analytical framework to



define the capacity for strategic monitoring, developed from the results of our doctoral thesis work. This framework is based on several conceptual models that have addressed strategic monitoring in its entirety (Jain, 1984; Lesca, 1990; Cohen, 2007; Brouard, 2007; Salvetat, 2008; Salmom, 1996; Dishman and Calof, 2008; Hermel, 2010), by integrating managerial practices in information management. The contextualization of items relating to strategic monitoring capacity was also carried out through empirical exploration, discussed with experts in monitoring and competitive intelligence, including both practitioners and academics specializing in information systems management. This Monitoring Capacity audit framework is structured around five fundamental practices, each subdivided into a total of sub-practices, detailed as follows:

Table of practices and sub-practices of strategic intelligence capacity

1. Intensity & extent of strategic monitoring
The practice of technological monitoring and patent monitoring
The practice of commercial monitoring
The practice of competitive intelligence
The practice of regulatory monitoring
The practice of sociocultural monitoring
The practice of image monitoring
The practice of human resources monitoring
2. Organizational practices
Existence of a central unit dedicated to strategic monitoring with a full-time manager in charge of monitoring
Existence of one or more information specialists (member(s) of the central monitoring unit), dedicated full-time, to answer questions posed by managers.
Existence of specific, decentralized and more or less formal monitoring units (marketing, production, HR, legal, etc.) which participate in strategic monitoring in parallel with their tasks prescribed by the management in place.
Existence of written rules and procedures governing the operation of strategic monitoring and the behavior of the actors involved. E.g., employees are required to fill out forms to report what they saw/read/heard at external events.
Presence of an external monitoring network (composed of: suppliers, customers, research and teaching establishments, etc.)
Existence of a multidisciplinary human resources monitoring network internally which would be motivated to communicate monitoring information
Use of external experts to support the company's monitoring efforts
3. Procedural practices
Existence of clear mechanisms and procedures for determining, prioritizing and updating information needs
Existence of clear mechanisms and procedures for searching, capturing and collecting information
Existence of clear mechanisms and procedures for processing, analyzing, synthesizing and formatting information
Existence of clear mechanisms and procedures for storing and accessing information collected and processed
Existence of clear mechanisms and procedures for disseminating and making available the results of monitoring (monitoring bulletin, reports, etc.)
Existence of clear mechanisms and procedures for using monitoring products in strategic decision-making
Existence of procedures for verifying and updating information to avoid errors and manipulations (« feedback » phase on the information disseminated)
Existence of measurement of the degree of achievement of monitoring objectives and formalized evaluation processes (e.g.: measures of effectiveness (MOE), ROI, the balanced scorecaR&D model, informal feedback from users).
4. Technical practices
Use of the Internet, intranets, databases and data warehouses
Use of popular, specialized and map search engines.
Use of media monitoring software and analysis software.
Existence of reporting tools that allow you to build, on quantitative databases, reports in the form of tables or graphs
Existence of OLAP (On-Line Analytical Processing) tools that allow multi-dimensional and interactive analysis of operational, aggregated and quantitative data
Existence of data mining tools that help extract knowledge from a large volume of data and using sophisticated statistical methods.
5. Information practices
Use of information sources collected during attendance at fairs, exhibitions, congresses, business events and relational networks etc. (human and sensory sources)
Use of sources from databases, patents, the general press, professional press and magazines, reports from research institutions and professional federations. (Written and documentary sources)

Thus, according to our conception, a sophisticated and fully mature strategic watch is defined as:

- A extent integrating and articulating several types of monitoring (So-Jin et al, 2014; Ahituva et al, 1998; Iansiti, 1999; Salmon et al, 1996), implemented with high intensity (Jain, 1984) in order to cover a multidimensional and constantly evolving field of observation. This approach involves the use of a plurality of radars, oriented in different directions, making it possible to capture the complexity and dynamics of the environment.
- An integration of several complementary components: it is based on a central formal monitoring unit (Guechtoili, 2014), located at the highest hierarchical level and responsible for centralizing information and coordinating full-time monitors, supplemented by decentralized units within the different business units (Jain, 1984), where formal monitors participate in monitoring alongside their usual missions. In addition, there are contributions from informal monitoring (Guechtouli, 2014), carried out by unofficial actors who support formal activities, as well as external collaborative monitoring, where the company exchanges strategic information with its partners and competitors to strengthen its position on the market (Salvetat et al, 2008; Goerzen et al, 2005; Kogut, 2000; Powell, 1990; Oxley et al, 2004). Finally, the whole is supported by a multidisciplinary internal monitoring network, mobilizing all employees to listen and analyze the environment proactively, thus ensuring the participation and involvement of all in the monitoring process Gilad (1995) Lesca (1994).
- A diversified exploitation of information sources, whether personal or impersonal, internal or external, as well as documentary or written. As Ramangalahy et al. (1996) point out, in the most advanced (proactive) monitoring model, companies mobilize and intensively exploit a wide range of sources to feed their strategic monitoring.
- An accumulation and integration of multiple technical monitoring tools, whether basic or advanced. Successful companies generally have more developed means of accessing and processing information than others. The quantity, diversity and quality of these tools, as well as their controlled use, constitute determining factors in the effectiveness of strategic monitoring.
- A structured and dynamic process linking information to decision-making. To be effective, this process must include clearly articulated and rigorously managed phases. In this context, we rely on the presentation of Cohen (2007), which describes a monitoring process organized into eight phases. Effective management of this process requires the company to establish explicit practices, mechanisms, and procedures, particularly emphasizing the importance of the evaluation, monitoring, and feedback stages. This is the most comprehensive and complete approach compared to other work.

Finally, our study is based on a structured information base around five fundamental practices, considered to be of equal weight, making it possible to measure the level of development of strategic monitoring and to position companies according to their mastery of this activity. Each practice is subdivided into a sufficient number of sub-practices to assess monitoring capacity, with each criterion representing a phenomenon actually observed and applied in business. The

responses to the questionnaire criteria are binary (YES/NO), with each criterion being assigned a score of 1 or 0 depending on whether it is practiced or not. When a criterion is present, it is weighted by a score of 1 to 5 depending on its level of development and maturity. We seek to establish an overall score reflecting the company's monitoring capacity (maturity), allowing its comparison and ranking within the sample. Total aggregation techniques appear to be the most suitable for this objective. However, the more the company multiplies, accumulates and develops innovative sub-practices, the higher the score for its ability to monitor its environment will be. Thus, the potential innovation index of firm i is defined as follows:

$$SMCi = \frac{\sum_{j=1}^{N} Nd_{ji}\, p_j}{N}$$

With:

$$Nd_j = \frac{\sum_{k=1}^{m} \delta_k W_{jk}}{Max\,(W_{jk}).m}$$

- SMCi: potential monitoring capacity of company i
- Ndji: The level of development of practice j of company i
- pj: The weight and importance of practice j. pj = 1 (principle of equal weighting)
- N: The number of practices retained = 5
- m: the number of sub-practices k in practice j
- δ_k: δ_k= 1 if the sub-practice exists; δ_k= 0 if it does not exist.
- Wjk: The level of development of sub-practice k in practice j. Wjk ranges from 1 to 5.

Thus, the scores, initially expressed as a percentage from 0 to 100%, will be converted into a metric scale ranging from 1 to 5: a score between 0 and 20% will receive a score of 1, while a score between 80 and 100% will be awarded a score of 5, with the intermediate intervals being proportionally distributed.

2.3 Performance of strategic monitoring system: Which metric?

According to the literature, measuring the benefits of strategic monitoring and evaluating its level of performance constitutes an essential but complex task, as Simon (1998), Gartz (2004) and Hannula et al. (2003) point out. The few authors who have addressed this issue highlight the difficulties linked to the development of reliable measuring instruments and credible performance and impact indicators, difficulties inherent in the very nature of monitoring activity. Roulet et al. (2015) point out that the evaluation of monitoring faces both methodological and practical obstacles, the main methodological challenge being the indirect nature of the impact of monitoring on the company's performance. In practice, the most frequent motivation for measuring monitoring activity is to justify its existence and demonstrate its usefulness for the company, usefulness which can be appreciated mainly through:

- **Satisfaction of user** (decision-maker) needs regarding quality, relevance, timeliness, actionability, accuracy of information produced and ease of use (Herring, 1996; Sawka, 2000; Choo, 2002; Davison, 2001; Moinet, 2006; Ranjan, 2008; Ben zammel et al, 2021). Seen as a practice of organizational information management, strategic monitoring is therefore part of the perspective of helping actors, in general, and managers in particular, to decide in contexts perceived as complex (Drevon et al, 2021; Ranja , 2008; Brouard, 2007; Caron-Fasan & Lesca, 2012; Du Toit, 2016; Guechtouli, 2014).
- **Detection of innovation opportunities**: Martinet et al (1989) specify that the role of monitoring is to feed innovation processes with usable information to apply it to new technologies and the creation of new products for current markets, and new markets. It is worth noting that companies that are most successful in launching new products show a strong correlation between innovative strategy and the intensity of application of strategic monitoring (Duan et al, 2020).
- **Financial repercussions**: For example, Subramanian and Ishak (1998) establish a relationship between monitoring and profitability defined as the return on invested capital.

In our study, we use decision-maker satisfaction as an indicator of strategic monitoring performance. This choice makes it possible to evaluate the effectiveness of monitoring in helping decision-making and supporting innovative initiatives, while presenting the advantage of being easily measurable, unlike ROI or participation in innovation, the collection of which is often difficult in an empirical context. As we did for the strategic intelligence capacity, we will use a 5-point Likert scale to measure the level of satisfaction of decision-makers, ranging from 1 to 5, where: 1 = Very dissatisfied; 2 = Dissatisfied; 3 = Neutral; 4 = Satisfied; 5 = Very satisfied

3. Empirical research methodology

To thoroughly examine practices and performance, we adopt an empirical approach which allows us to collect concrete and usable data to confirm or refute the central hypothesis. The methodology is divided into three parts: the definition of the study population to limit the research field and identify the relevant individuals; the collection of data via a structured questionnaire, designed to gather information on practices and measure user perceptions as well as the associated performance indicator of strategic monitoring; and finally, data analysis using univariate techniques, Principal Component Analysis (PCA) and regression to explore the relationships between variables and derive meaningful results.

3.1 Population: Human use drug manufacturing branch

The definition of the population study is a key factor influencing the reliability and quality, not only of the empirical study, but also of the entire research. For this reason, we took care in selecting a target population compatible and consistent with the nature of the subject and the problem studied. The pharmaceutical industry constitutes a particularly relevant framework for this study, due to its dynamic innovation, its international openness, the richness of its ecosystem, as well as its critical nature which requires constant vigilance in terms of regulation, technologies and competition. In order to focus our analysis and obtain precise and usable results, we chose to focus on the Manufacture of medicines for human use branch, which represents the largest share of the sector in terms of production units, jobs and exports. Among the 43 industries in this branch, we selected 29 units (created before 2018). The selection criterion was the prior presence of a monitoring structure, whether formal and/or informal, in order to guarantee the relevance of the data collected for the analysis of the practices and performance of strategic monitoring. The 29 selected units belong to the private sector, while two public entities, SIPHAT and the Pasteur Institute, were excluded due to their governance and operations being different from those of private companies.

3.2 Data collection: questionnaire survey

To ensure the validity and relevance of the measurements and data produced, we opted for a quantitative study based on a questionnaire survey. Our measurement scales were extracted from existing measurement scales, resulting from an in-depth theoretical exploration in the scientific literature. It is essential to emphasize that the choice of these scales was also the result of in-depth discussions with stakeholders in the field. These discussions made it possible to adjust and validate the scales based on the practical expertise of those directly involved in the field of study. This empirical exploration helped to refine the relevance of the items, to ensure their understanding within the community concerned, and to strengthen the validity and reliability of the questionnaire. For most of the closed questions in our questionnaire, we use 5-point Likert scales allowing respondents to indicate the degree of development (or frequency) of their strategic monitoring practice, ranging from (1 = very little developed) to (5 = very developed) with the third modality being average (3 = moderately developed), (0 = non-existent). Regarding the method of administering the questionnaire, we administer the questionnaire ourselves direct administration.

3.3 Analysis techniques

To analyze the collected data, we will use various techniques for exploration and then confirmation purposes. This methodological approach will allow us to obtain reliable information from the data we have collected. In the exploration phase, we begin by carrying out an initial descriptive analysis of the data. This step will include a uni variate and multivariate descriptive analysis (PCA). Finally, we will carry out confirmatory analyses (regression) to test the hypothesis formulated in the theoretical part.

4. Empirical results: Analysis of strategic monitoring practices and evaluation of the performance of current devices

This section presents the results of our empirical study. To do this, we used exploratory uni variate and principal component analysis (PCA) techniques, as well as regression analysis, to examine several dimensions of strategic intelligence within the companies in our sample. The objective is to explore the age of the systems, their importance, their organizational positioning, and to test the relationship between monitoring maturity level and its performance, evaluated through the degree of satisfaction of decision-makers.

4.1. Place and importance of strategic monitoring within the sampled companies

This section examines strategic monitoring from two complementary perspectives: the diversity of organizational mechanisms and the seniority and commitment of companies to their implementation.

4.1.1 Multiplicity of approaches in the organization of strategic monitoring

All companies in the sample opted to integrate a unit dedicated to strategic monitoring, in which a full-time manager is responsible for supervising monitoring activities. The analysis of the organizational position of strategic monitoring within these companies highlights different logics which reflect both the perceptions and the strategic priorities of the companies. Indeed, the creation of an independent monitoring service directly attached to General Management, although a minority (20.6%), illustrates the desire of certain companies to give this function a central role in decision-making. This choice reflects an advanced vision where monitoring is considered a strategic instrument in its own right. Conversely, the integration of monitoring into the Information Systems department (34.5%) reflects a more technical conception. It reflects an approach oriented towards the collection, processing and management of data. This positioning therefore carries the risk of reducing monitoring to a technical support role, to the detriment of its prospective and decision-making dimension. Finally, the fact that almost half of companies (45%) associate strategic monitoring with their Research and Development department demonstrates a clear orientation towards innovation and the development of new products or processes. Monitoring is then seen as an essential support for anticipating technological trends and strengthening competitiveness. However, this approach, focused on technological innovation, can prove reductive if it neglects other dimensions of the external environment, such as competition, regulation or societal changes. Overall, these results show that the structure of strategic monitoring remains

heterogeneous. The minority of companies that have chosen to link monitoring directly to General Management illustrate a rather global and integrated concept, capable of articulating strategic, technical and technological dimensions. Conversely, nearly 80% of companies still limit themselves to a partial vision, considering monitoring either as a technical activity linked to information systems, or as a lever for innovation confined to the R&D department. This fragmentation reduces the strategic scope of monitoring and hinders its potential as a decision-making tool.

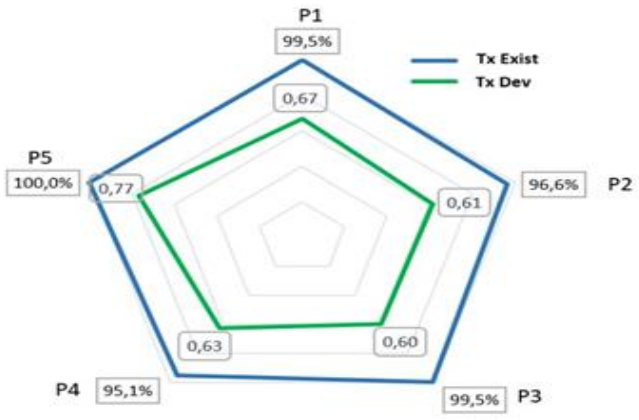
4.1.2 Experience and involvement of companies in strategic monitoring

Strategic monitoring is deeply rooted in the culture of our population's businesses, with a large majority of them having invested in this practice for many years. Nearly 70% report having more than six years of experience, and 65% even say they have been practicing competitive intelligence for more than nine years. These results reflect a sustained commitment of time and resources in this area. Conversely, only 14% of the companies surveyed had recently started using strategic monitoring, with less than three years of experience. These results show that strategic monitoring is perceived by businesses in our population as an essential element for remaining competitive and well-informed. An additional result confirms this trend: nearly 80% of companies have implemented a strategic monitoring system following an initiative taken by top management.

4.2 Exploration of current strategic monitoring practices

On a global scale, the flat sorting of raw data reveals that the companies in our sample adopt all 30 identified strategic monitoring sub-practices. The graph below shows frequencies close to 100% for each of these practices. Exploratory analysis also indicates a lack of distinctive and particular preference, with an average level of development of around 65% for these practices within the companies studied.

Rate of adoption and development of strategic monitoring practices



4.2.1 Extent and intensity of strategic monitoring

The companies in our sample show a clear preference for traditional monitoring practices. Among these, technology monitoring, competitive monitoring, technological monitoring, and regulatory monitoring stand out for their high development rates and intensity, well over 67%. This focus is explained both by the proven effectiveness of these approaches and by the perception that they are the most suitable for their sector of activity. Given that this population operates in the pharmaceutical manufacturing sector, it is quite logical that regulatory monitoring is the most predominant type of monitoring, with an intensity of 80%. This high intensity is explained by the highly regulated nature of the pharmaceutical industry. In the context of the pharmaceutical industry, it is interesting to note that sociocultural monitoring and image practices do not appear to be elements of significant importance (50%). This observation can be explained by several factors specific to this particular sector. Therefore, the emphasis is often placed on communicating objective and scientific data rather than on elements related to brand image or sociocultural aspects.

4.2.2 Organizational practices

This section presents an overview of the organization of strategic monitoring within companies, the practices which directly influence its quality and its capacity to support decision-making. Regarding this practice, the trend is towards the simultaneous adoption of centralized (64%) and decentralized (63%) structures. This coupling in the organizational approach explains the desire of companies to exploit the best of both modes to optimize their strategic monitoring capacity. The advantages of centralization include better coordination of monitoring activities and efficient use of specialized resources. On the other hand, decentralization allows for increased proximity to the specific needs of the company's different operational units, thus promoting good responsiveness.

A second equally important trend is the development of (external) network monitoring (65%) and the increasing involvement of external experts (70%). This network monitoring approach is proving increasingly essential in a turbulent environment, where information circulates rapidly. Furthermore, outsourcing to external experts allows organizations to benefit from specialized knowledge, gain new perspectives, and remain at the forefront of their field of activity.

Finally, a final important aspect to note is the lack of formal rules and procedures governing the practice of strategic monitoring as well as the behavior of the individuals involved (54% of cases). This gap can result in a lack of structure and consistency in how information is collected, analyzed and used within the organization. When these rules and procedures are lacking, the actors involved may act in an unorganized manner, which can lead to inconsistent results and inefficient

use of information resources. It is imperative that these companies take steps to address this situation by developing formal, written guidelines.

4.2.3 Procedural practices

Regarding the procedural practices of strategic monitoring, a particularly interesting observation emerges. Companies seem to place relatively equal importance on each phase of their monitoring process. However, we note a slight underdevelopment in the last two stages of the strategic monitoring process: evaluation and control. However, these two steps are extremely important for ensuring the effectiveness and relevance of strategic monitoring. Without proper monitoring and regular evaluation, it is difficult to determine whether monitoring practices are truly aligned with the company's strategic objectives. The assessment also helps identify potential weaknesses and areas for improvement. Ultimately, improving these steps in the business intelligence process can help strengthen the overall quality of intelligence and ensure it plays an effective role in strategic decision-making within the company. This requires an awareness of their importance and a commitment to implementing rigorous procedures and evaluations.

4.2.4 Technical tools for strategic monitoring

The most developed tools are essentially basic monitoring tools such as the Internet, intranets, databases, data warehouses, the use of popular, specialized and cartographic search engines and the use of media monitoring software and analysis software. Although traditional business intelligence tools are essential, it is important to complement them with more flexible and agile technologies that take into account the rapidly changing environment and the diversity of available information sources. This allows a company to remain competitive and well-informed in the face of challenges and opportunities. Moreover, the increasing complexity of data often requires advanced analytics tools to extract actionable insights. Conventional monitoring tools can be limited in their ability to manage and analyze large amounts of unstructured data, which can lead to underutilization of available information.

4.2.5 Information practices

At this level, we observe that the companies in our population show relative indifference as to the type of information sought, whether it is documentary or sensory information. This neutrality seems to reflect a pragmatic approach, where the essential thing lies in the relevance of the information to meet the specific strategic needs of each company, regardless of its form or nature. This observation is in line with the work of Jain (1984), which indicates the non-existence of a statistically significant distinction in the hierarchy of sources and types of information between companies regardless of the stage of analysis of their environment.

To sum up, the companies surveyed appear to adopt a relatively traditional approach to managing their business intelligence units. This approach is based primarily on a focus on basic types of monitoring, the use of less advanced technical tools, and a process that focuses primarily on conventional phases, such as research, collection, processing, and dissemination of information. However, what is worrying is the tendency to underestimate the importance of the monitoring and evaluation phase. Ignoring the monitoring and evaluation phase could potentially deprive these companies of the strategic benefits that business intelligence can offer. It is therefore imperative to recognize the importance of this phase and integrate it more fully into business intelligence practices.

4.3 Impact of Strategic Monitoring Maturity on Decision-Making Satisfaction

This section focuses on decision-makers perceptions of the effectiveness of the strategic monitoring system within their company. The chosen indicator, decision-maker satisfaction, is a relevant indicator because it directly reflects the ability of monitoring to provide useful and usable information for strategic decision-making. The monitoring system studied shows an average level of development of 64.5%, corresponding to a decision-maker satisfaction rate of 66.9%. This convergence indicates that the organizational and structural maturity of the system is proportional to its ability to meet user expectations.

To examine this relationship, we implemented a simple regression statistical analysis. Before proceeding to this step, a principal components analysis was performed. The analysis of the measurement indicators of the variable strategic monitoring capacity (SMC) led to the emergence of a single component. The results obtained revealed that this component explained a significant percentage of the total variance, with a satisfactory factor solution adequacy index (KMO = 0.876, greater than 0.6). These results highlight the internal consistency of the variables included in the measurement of strategic monitoring capacity.

Unidimensional nature of the strategic monitoring capacity variable

Practices	PV1	PV2	PV3	PV4	PV5	ALPHA	KMO	% variance
Eigen values	0.879	0.892	0.905	0.907	0.879	0.931	0.876	72.84%

Both metrics (alpha and KMO) confirm that the PCA was a perfectly valid approach. The construction of the SMC as a composite score summarizing the variables PV1 to PV5 (PV: monitoring practice) is statistically justified. We can therefore use the SMC score with confidence for regression analyses. The regression analysis shows that: The maturity of the SMC monitoring system as a composite explanatory variable of performance is an excellent indicator which alone explains 66% of decision-maker satisfaction (R squared = 0.659). However, the 34% of unexplained variance in decision-

makers' satisfaction means that more than 1/3 of the factors that influence their satisfaction fall outside the scope of strategic intelligence alone.

Regression results

	Coefficient	p-value
Constant	3.345	< 0.001
SMC	0.991	< 0.001
R carré = 0.659 / R ajusté = 0.646		

In the context of my doctoral research (Sadok, 2024), focusing on the same sample of companies, none of the identified monitoring practices have a significant impact on ex post technological performance. The results of this study show, however, that decision-makers are generally satisfied with their monitoring system (66.9%). This apparent contradiction suggests that monitoring alone is not sufficient to generate tangible technological performance, and that it must interact closely with other organizational subsystems such as innovation management, knowledge management or strategy, in order to achieve the desired performance levels.

5. Conclusion

This study shows that the maturity of the monitoring unit has a strong and positive impact on decision-makers' satisfaction. This result is consistent with the arguments already put forward in the theoretical part. It constitutes a dynamic strategic capability to inform and support decision-making, but it is not sufficient to transform the organization and create a sustainable and defensible competitive advantage. To maximize decision-maker satisfaction, it is recommended to continually strengthen the maturity of the strategic monitoring system by developing its organizational, procedural, technical and informational dimensions, while regularly training and raising awareness among key users. At the same time, it is important to identify external monitoring factors that enable information to be transformed into a sustainable competitive advantage, such as R&D support, technical expertise, the quality of inter-departmental communication or the integration of information into decision-making processes. The direct involvement of decision-makers and stakeholders, as well as the establishment of regular feedback, also contribute to maximizing the strategic use of the information collected. The final recommendation is therefore not simply to improve intelligence, but to use it as the foundation of a more comprehensive system of information retrieval, innovation, and value creation.

This study also highlights the complexity and sensitivity of choosing performance measurement indicators for a strategic intelligence system. Indeed, performance evaluation largely depends on the nature of the indicator chosen: while the satisfaction of decision-makers is a relevant indicator of the feeling and perceived usefulness of the system, it does not necessarily reflect tangible performance observed a posteriori, such as technological, economic or organizational gains. In other words, a positive perception of the monitoring system does not guarantee an effective improvement in operational results. This divergence underlines the need to adopt a multidimensional approach to performance evaluation, combining subjective indicators (of satisfaction) and objective indicators (of measurable results), in order to obtain a more complete and nuanced view of the real effectiveness of the strategic intelligence system.

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Annexe-*Strategic Monotoring Capacities (SMC): Calculation*

Entreprise	PV1.1	PV1.2	PV1.3	PV1.4	PV1.5	PV1.6	PV1.7	ND1	PV2.1	PV2.2	PV2.3	PV2.4	PV2.5	PV2.6	PV2.7	ND2
E6	5	5	5	3	2	3	1	0,69	3	3	3	1	3	3	4	0,57
E1	3	3	3	4	1	1	4	0,54	3	4	4	3	3	3	4	0,69
E2	4	4	4	4	4	4	4	0,80	4	4	4	4	3	4	5	0,80
E3	2	2	2	2	2	2	2	0,40	0	0	5	0	3	0	5	0,37
E5	3	3	3	3	3	3	3	0,60	2	1	3	1	3	3	4	0,49
E7	5	5	5	5	5	5	5	1,00	5	5	5	5	5	5	5	1,00
E8	4	3	3	5	1	1	2	0,54	3	3	2	1	4	3	4	0,57
E9	4	4	3	4	0	3	2	0,57	3	3	5	1	3	4	3	0,63
E10	3	3	3	3	3	3	3	0,60	3	3	3	3	3	3	3	0,60
E12	4	4	4	4	4	4	4	0,80	3	2	4	3	4	4	4	0,69
E11	4	5	5	5	2	2	3	0,74	4	4	3	3	4	3	4	0,71
E4	4	4	4	4	4	4	4	0,80	4	4	4	3	4	5	4	0,80
E13	2	2	2	5	2	2	4	0,54	2	0	2	0	4	2	4	0,40
E14	4	4	4	4	3	3	4	0,74	4	4	3	3	5	5	5	0,83
E15	3	3	3	3	3	3	3	0,60	2	2	3	2	4	4	4	0,60
E16	5	5	5	5	3	3	3	0,83	4	4	2	2		3	3	0,51
E17	3	3	3	3	3	3	3	0,60	3	3	4	3	3	3	4	0,66
E18	3	3	4	5	2	2	4	0,66	4	4	3	3	4	3	4	0,71
E19	3	4	4	4	3	3	3	0,69	3	3	2	1	3	3	3	0,51
E20	3	2	4	4	2	3	3	0,60	2	1	3	2	4	3	4	0,54
E21	4	4	4	4	4	4	4	0,80	4	4	3	3	4	4	4	0,74
E22	4	3	3	5	2	2	2	0,60	3	3	3	2	4	4	4	0,66
E23	3	1	3	3	1	1	2	0,40	3	2	2	2	1	1	4	0,43
E24	4	3	4	4	3	3	4	0,71	4	4	2	4	3	3	3	0,66
E25	2	3	4	5	2	3	2	0,60	4	2	2	2	3	1	2	0,46
E26	4	3	4	4	3	4	4	0,74	3	3	3	1	1	1	1	0,37
E27	4	3	5	5	3	4	4	0,80	4	4	4	4	4	3	3	0,74
E28	5	4	5	5	2	4	3	0,80	5	4	4	4	4	3	3	0,77
E29	4	3	4	3	1	2	1	0,51	2	2	1	1	2	1	0	0,26
MD								0,67								0,61
Resist	100,0%	100,0%	100,0%	100,0%	96,6%	100,0%	100,0%	99,5%	96,6%	93,1%	100,0%	93,1%	100,0%	96,6%	96,6%	96,6%

Entreprise	PV3.1	PV3.2	PV3.3	PV3.4	PV3.5	PV3.6	PV3.7	PV3.8	ND3	PV4.1	PV4.2	PV4.3	PV4.4	PV4.5	PV4.6	ND4	PV5.1	PV5.2	ND5	CV5
E6	3	3	3	3	3	3	4	3	0,63	2	1	0	4	4	2	0,43	4	4	0,80	0,62
E1	4	4	4	4	4	3	3	3	0,73	5	5	4	4	4	4	0,87	4	5	0,90	0,74
E2	4	4	4	4	4	4	4	4	0,80	5	5	5	5	5	4	0,97	5	4	0,90	0,85
E3	2	2	2	2	2	2	2	0	0,35	5	5	2	2	0	1	0,50	5	4	0,90	0,50
E5	3	3	3	3	3	3	3	3	0,60	4	4	4	4	1	2	0,63	3	3	0,60	0,58
E7	5	5	5	5	5	5	5	5	1,00	5	5	5	5	5	5	1,00	5	5	1,00	1,00
E8	2	2	2	2	2	2	3	3	0,45	4	3	2	1	1	1	0,40	4	3	0,70	0,53
E9	3	3	3	3	3	3	2	1	0,53	3	2	2	1	1	2	0,37	5	5	1,00	0,62
E10	3	3	3	3	3	3	3	3	0,60	4	3	2	2	2	2	0,50	3	3	0,60	0,58
E12	3	3	3	4	3	3	4	3	0,65	5	5	5	3	3	4	0,83	4	4	0,80	0,75
E11	4	4	4	4	4	4	4	4	0,80	4	4	3	3	0	4	0,60	4	4	0,80	0,73
E4	4	4	4	4	4	4	4	4	0,80	5	5	5	5	5	5	1,00	5	5	1,00	0,88
E13	2	2	2	2	2	2	2	2	0,40	4	2	2	2	2	2	0,47	4	3	0,70	0,50
E14	4	4	4	4	4	4	4	4	0,80	5	5	5	5	3	4	0,90	5	4	0,90	0,83
E15	3	3	3	3	3	3	3	3	0,60	4	3	3	3	3	3	0,63	4	4	0,80	0,65
E16	3	3	3	3	3	2	2	2	0,55	4	4	3	3	3	3	0,67	5	3	0,80	0,67
E17	3	3	3	3	3	3	3	3	0,60	5	3	3	3	2	2	0,60	5	3	0,80	0,65
E18	4	4	4	4	4	4	2	3	0,73	4	3	2	3	2	3	0,57	5	5	1,00	0,73
E19	2	2	2	3	3	3	2	2	0,48	4	3	3	3	3	3	0,63	4	3	0,70	0,60
E20	3	2	2	2	2	2	2	2	0,43	3	3	3	3	3	3	0,60	3	3	0,60	0,55
E21	3	3	3	4	4	4	3	3	0,68	4	4	4	4	4	4	0,80	4	4	0,80	0,76
E22	3	3	3	3	3	3	3	3	0,60	4	3	3	3	3	3	0,63	4	4	0,80	0,66
E23	2	2	2	2	2	2	2	2	0,40	4	3	3	3	3	3	0,63	4	3	0,70	0,51
E24	3	3	3	3	3	3	3	3	0,60	4	4	3	3	2	3	0,63	4	4	0,80	0,68
E25	2	2	1	2	1	2	2	1	0,33	1	2	1	1	0	3	0,27	2	2	0,40	0,41
E26	2	2	2	2	2	2	1	2	0,38	2	1	0	1	2	0	0,20	2	3	0,50	0,44
E27	4	4	4	3	4	4	3	3	0,73	5	5	4	3	3	4	0,80	5	4	0,90	0,79
E28	3	4	4	4	4	3	3	2	0,68	5	5	5	3	0	4	0,73	4	4	0,80	0,76
E29	2	3	3	3	3	2	2	1	0,48	3	3	3	0	0	0	0,30	1	2	0,30	0,37
MD									0,60							0,63			0,77	
Resist	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	96,6%	99,6%	100,0%	100,0%	93,1%	96,6%	82,8%	93,1%	94,3%	100,0%	100,0%	100,0%	